GLEANINGS IN BEE CULTURE
A JOURNAL DEVOTED TO BEES AND HONEY AND HOME INTERESTS
ILLUSTRATED SEMI-MONTHLY
PUBLISHED BY A. I. ROOT
$1.00 PER YEAR MEDINA OHIO

Vol. XXII. OCT. 15, 1894. No. 20.

STRAY STRAWS
FROM DR. C. C. MILLER.

FOR DIARRHŒA, Pfarrer Kneipp says take pure yellow beeswax, the size of a pea, once an hour.

MY TWO-GALLON CROCK feeder worked first-class. Don't know but it's best of all. [Yes, sir!—ED.]

"HONEY-PLANT" is a common term in this country, and "bee-flower" stands for the same thing in England.

WHAT'S BEST to make water-tight the inside corners of a feeder—white lead, beeswax and rosin, pure beeswax, or what?

M. M. BALDRIDGE mentions, in *A. B. J.*, a man who sowed 80 acres of sweet clover. He keeps no bees, but sowed it for hay and pasture, and to enrich the soil.

IN SHIPPING BEES, C. Dadant says, in *Revue*, he would give no water, no pollen, no brood, only *sealed* honey. All this to avoid having the bees' intestines distended.

TO SHAKE BEES off a heavy comb, hold the frame with both hands; if the comb is light, better hold it with the left hand, and pound with the right fist on the left.

A LIVELY ROUND, THAT, 'twixt the light-weight and heavy-weight on page 757. Sick 'em! [Yes, sick 'em. Come off that fence, and try a round yourself.—ED.]

TOBACCO I don't use; but I use 1¼-inch tobacco staples, and like them the best kind to fasten covers and bottoms on hives. [I've tried the same things; they are good.—ED.]

KISSING is tabooed by Dr. Peiro, in *A. B. J.*—at least, *indiscriminate* kissing, especially of babies, on the score of health. The blessed babies will all want to kiss Dr. Peiro for coming to their rescue.

'TISN'T FAIR, Bro. Hatch, for you to take hold of my leg and pull. Let me alone on the fence till I see on which side is the best landing, and then I'll jump on that side. [You can even things up a little, Bro. H., by pushing that leg on to my side. The doctor has been on the fence long enough.—ED.]

GERSTUNG says extracting during fruit-bloom is good, as returning the extracted combs to be cleaned up excites brood-rearing, but the same thing is not advisable in the main harvest, as it excites swarming.

REPLIES in *A. B. J.* leave the impression that absence of drones is no security against swarming. [Say! is there any thing that is a security against swarming in the production of comb honey, in the case of a normal colony during the swarming season?—ED.]

GRAVENHORST says that American lindens planted in Germany give far greater yields than European. [Of *course*, he doesn't mean Canadian lindens. They are not as good, you know, as the linden on this side.—ED.]

THE HEAVY RAINS following the terrible drouth have fooled vegetation into thinking it is spring. I never knew grass so bright green in the fall, and dandelions are blooming by the hundred. [Just so here at Medina.—ED.]

LE RUCHER, Amiens, France, illustrates and describes the Simplicity, portico, and chaff hives as three American hives. They *were* prominent American hives, respected *Rucher*, but have now given place to the Dovetail hive.

A PERCOLATING FEEDER isn't fit for late feeding. Feed too thin. But then no feeding ought to be done late. [Yes; and if late feeding *must* be practiced, the old thick syrup (2 of sugar and 1 of water) should be fed in the old way.—ED.]

EGGS, 2000 daily, is only an average for a good queen. Before the development of her ovaries she weighs .2 gram; 2000 eggs weigh .42 gram, so she lays more than twice her own weight of eggs daily. But the workers digest her food for her.

A WRITER in *Schweizerische Bienenzeitung* says bees don't propolize their hives for warmth, but as protection against the bee-moth, closing the cracks where eggs might be

laid. [I hope he is right; then we will turn our attention toward getting the bee-moth extinct.—Ed.]

I was reading in the French bee-journal, *Le Rucher*, an interesting article on the anger of bees, and something about it seemed strangely familiar. After reading two or three pages I glanced at the end, and there saw "translated from Root's A B C."

The chief honey-plant being asked for in *A. B. J.*, 14 mention white clover; 11 linden; 3 heartsease; 2 Spanish needle; and the following are each mentioned once: Poplar, white sage, wild buckwheat, locust, alsike, catclaw, horsemint, mesquite, fruit-bloom, and goldenrod.

Carbolic acid, painted over cracks where robbers are at work, seems effective. Why mightn't it be good at the entrance of a robbed hive? [I've tried it. It is too much of a good thing. It disconcerts the inmates of the hive as well as the robbers; and after a little the latter seem to take advantage of the situation. —Ed.]

To avoid cracks in cakes of wax, don't let the outside cool rapidly. Cover a cloth and board over the dish while cooling, or let it stand in a stove oven while the fire dies out over night. [But what harm do cracks in large cakes do, any way? We cake the wax the handiest and quickest way, cracks or no cracks. —Ed.]

A balled queen, we are told to release by blowing smoke on the ball. But there's a right and a wrong way. Hold the nozzle of the smoker close to the ball, and blow hot smoke on them, and you might about as well step on the ball. Hold your smoker at a distance and blow cold smoke on the bees, and all will be lovely.

Remember, when robbers are troublesome, do any thing, *any* thing, rather than take out of their way the thing they are robbing, without leaving something in its place. Outside appearances must remain unchanged. [This looks like bad advice; but I am coming to believe it is all right, notwithstanding A. I. R. thinks it is all wrong.—Ed.]

"Fegling" is the German name for a kind of artificial swarm originating with Gravenhorst, and indorsed by Gerstung as coming nearest to a natural swarm. From a strong colony, take one frame of brood, with adhering bees and queen; put in empty hive on a new stand; fill out with partly built combs; brush into it all the bees, and trust old bees to return to old stand and raise a queen. Hardly looks right, does it? But remember Gravenhorst is no spring chicken.

John Galvin, p. 765, says if the bees build foundation to the bottom-bar they'll surely cut it out again, and my assistant has been encouraging me by the same dismal prophecy. Well, the bees have cut out some, in one case leaving a space of 1½ inches between foundation and bottom-bar, but I don't believe they'll be so naughty in a good season, and I don't expect them to disturb it after they have pulled out cells full depth.

THE TREATMENT OF FOUL BROOD WITH DRUGS.

A SUCCESS IN FRANCE.

By Charles Norman.

It were a mistake for us to suppose that, in this country of ours, there are no bee-keepers who believe in the treatment of foul brood with drugs, or, as the scientific expression is, the antiseptic treatment. There are some, no doubt, but at the present time they evidently take a back seat since our leaders unanimously denounce said treatment as a failure. Prof. Cook, the Roots, Mr. R. L. Taylor, Dr. Howard in his work on foul brood, and others, differing solely in regard to some details, practice and advocate "that sure and reliable method, transferring, as first announced by Mr. M. Quinby, and, later, recommended by D. A. Jones." Not so in France and Switzerland. There lie before me several of the latest numbers of *Revue Internationale d'Apiculture* (International Review of Apiculture), edited in French by Mr. Edouard Bertrand, at Nyon, Switzerland. On pages 28—30 he relates, for the benefit of those of his readers who might not have succeeded by the use of disinfectants, an extract from Mr. R. L. Taylor's article on foul brood, which had appeared in the February number of Mr. Hutchinson's *Review*. According to Mr. Bertrand's opinion, however, the transferring plan has by no means always given satisfactory results; is too troublesome, is connected with the destruction of the frames, and arrests the development of the brood for some time. In conclusion, mentioning Mr. Taylor's assertion that, though trying the use of carbolic as well as salicylic acid, in quite a number of cases, he never saw even a sign of improvement through them, Mr. Bertrand says: "This assertion is somewhat surprising to us, for, as several times we had an opportunity to tell, we have personally received a radical cure of 37 colonies by the use of salicylic acid." Quite a dilemma, the solution of which can be found only in the fact that Mr. Bertrand must have followed a method entirely different from Mr. Taylor's; for it would not do to say that perhaps those cases Mr. Bertrand speaks of had not been the real foul brood. Every page of Mr. Bertrand's

Revue proves that he *is* a bee-keeper; and when he says that he has cured foul brood he *has* done it.

On pages 98 and 99 Mr. Charles Vielle-Schilt reports two cases of foul brood which he cured by the antiseptic treatment. I remark, however, that, in both of them, the disease was in just its incipient stages. In the first case, he commenced with cutting out every particle of sick brood, leaving of the cells whatever could be saved, and cleaning them well. Then, after brushing off the bees, he put these cleaned frames, as well as those which contained only honey, into an empty hive, where he exposed them to the vapors of sulphur for several days; this hive was to receive the colony afterward. As to the other, in the affected hive he killed the queen and confined the bees to the frames which contained healthy brood. Then he fed them an antiseptic food, a treatment that has to be continued for a long time—at least, till the bees hatch from a new queen. The food consisted of two kinds of syrup, which were given alternately, every other day each. The first mixture consisted of a litre of sugar or honey syrup, to which a gramme of naphtol dissolved in rectified spirits of wine had been added. For the second mixture, instead of the naphtol a little stronger dose of camphorated alcohol was used. The second mixture has to be administered because the bees, "on account of the remedy, have pains" to take the first. At the same time, pieces of camphor, enveloped in cloth, were placed under the frames. The same precaution was also taken with the hives near the diseased one. For twelve days the colony was left undisturbed, when an open queen-cell was found, and all the others were destroyed. On the 21st day the colony was transferred into that hive which contained those sulphured frames, and which had previously been exposed to the air to remove the odor of the sulphur. Having a better queen than the one reared by the colony, the latter queen was killed and the other one introduced in a cage. How long the colony was fed with those mixtures is not stated; but Mr. Vielle-Schilt asserts that the colony, as well as its stores, increased fast; that the bees, when put into winter-quarters, did not show any signs of the disease, and that in spring they prospered and were in fine condition.

The other case, found in a straw hive in fall, at the end of September, was treated differently. All the brood that could possibly have been diseased was cut out and destroyed, and pieces of camphor, enveloped in cloth, were placed in that part of the hive where no combs were. The colony received no other care. In April the smell of the camphor was still perceptible; some fine brood was to be seen in newly constructed cells, and the disease had entirely vanished.

On pages 70 and 71 a correspondent reports that, on the 18th or 19th of July, when opening a hive he noticed that the colony had foul brood. He directly administered a dozen pieces of naphthaline. Four days later the disease had increased, for all the four combs that contained brood were attacked and all cells burst. He then removed the naphthaline and gave a mixture of syrup and eucalyptus tincture, the latter consisting of one part of essence of eucalyptus and nine parts of pure alcohol. At the commencement he used one teaspoonful of tincture to a litre of syrup; then he gave two teaspoonfuls, then three. After eight days of this treatment the middle of the diseased frames was clear, and filled with eggs; and, besides the original four frames of brood and eggs, two more frames of eggs were seen. A fortnight later, the colony had ten frames of perfectly healthy brood, and eggs (the frames were small, only six decimeters square*); on only one of those four originally diseased combs a few larvæ were doubtful. A week later the foul brood had entirely disappeared, the hive contained considerable honey, the colony was active, and wintered splendidly. Some camphor was placed in all the other hives, and a teaspoonful of eucalyptus tincture added to the winter food of each. A neighbor of the correspondent also used eucalyptus tincture with the same good result. In April the same correspondent reports that said colony wintered best of all his colonies, and that it was one of his very strongest. He adds that he had forgotten to mention that, before treating the colony, he removed it from its hive and washed the latter in boiling chlor., after which he returned the colony to the hive. His neighbor had washed his hive with sublimate. Mr. Bertrand remarks in a footnote, that said treatment is the one introduced by Messrs. Bauverd, Delay, and Auberson, and recommended in his (Mr. Bertrand's) book, "Conduite" (Management), and that, on account of its "pronounced" savor, the dose of eucalyptus tincture (like phenyl, naphtol, etc.) has to be augmented gradually.

On pages 25—27, Mr. Ulv. Gubler writes about formic acid. "It is," he says, "perhaps the most powerful antiseptic known. Thanks to it, the honey preserves itself indefinitely. There has been found at Dresden, in the eaves of an old house, some well-preserved honey, dating back to the fifteenth century!" Thanks to the formic acid, with which the air of the hives is always saturated, the frames, the pollen, and the nourishment of the larvæ, keep without fermenting. Mr. de Planta relates an experience of Prof. Erlenmeyer, at Munich, who put a little formic acid, which had been well diluted in water, into a certain quantity of beer in full fermentation. It immediately arrested the fermentation. It is quite natural that the apiculturists said to themselves, "If the formic acid

*That is not very small—23⅛x23⅛.—Ed.

is powerful enough to kill the ferment of the bee, would it not likewise annihilate the germs of foul brood?" And, really, many practitioners pretend that it is the best means to arrest and cure that terrible disease of the brood.

The *Schweizerische Bienenzeitung* (Swiss Bee Gazette) cites some experiments which have been successful. One proceeds thus: "The bees of a diseased colony are, as much as possible, contracted on some frames. All the other frames are set aside. In a frame with empty combs, there is let drop from a certain height, in a thin stream, 100 grammes of formic acid at 20 per cent, and then it is placed in the middle of the infected colony. If the weather is fine, and permits the bees to fly, all the attacked brood will be abandoned in eight days, the cells will be cleaned, and all bad smells will have disappeared. Seldom is one obliged to repeat the operation. To preserve the other colonies, it is well to place in them a small bottle with the acid, corked lightly with a little cotton. To hasten the cure, one can, without fear, mix the remedy with the food of the bees, a teaspoonful to the litre." Three of our friends, in whose apiaries the foul brood had appeared, have applied the remedy with success. When we visited them we noticed a good deal of brood in a state of complete putrefaction, while, a few days later, these colonies were already better. When they had to be put into winter quarters they were strong and in good condition. After this, Mr. Gubler speaks of the origin of the formic acid, and says that, according to Mr. de Planta's scientific and irrefutable researches and analyses, it is neither contained in the nectar of the flowers nor does it come from the air in the hives; but its origin is to be found in the blood of the bees.

St. Petersburg, Fla., Aug. 31.

[As Mr. Norman truly states, we in this country do not take much stock in the antiseptic or medicine treatment; but Mr. Bertrand is one whose opinion should be given some weight. It is with pleasure that I give place to the above for what it is worth; for if a successful antiseptic may be discovered, it would save a large expense. This is the first of a series of articles from our foreign exchanges.—Ed.]

RAMBLE 118.

THE MERCER FAMILY, ETC.

By Rambler.

In this ramble I wish to place Mr. Mercer in a little different role from that in which he was a prominent actor in our last. It is hardly necessary for me to introduce him to your readers, and especially the readers of Gleanings on this coast. Mr. Mercer is widely known here as an extensive and successful bee-keeper. He was an enthusiastic bee-keeper many years ago, away back in Iowa, and for at least thirty years he has had an interest in bees and bee-literature. His married life dates back that number of years, and, from his happy surroundings, it would seem that his honeymoon has never waned. Mr. Mercer has four apiaries, and a total of 700 colonies. Last year, 1893, from 300 colonies, spring count, he obtained 24 tons of honey, and increased to 600 colonies. This year, from 750, spring count. Mr. Mercer writes me that his yield is represented by a string of ciphers, with a decrease of 50 colonies.

In connection with the bee-business, Mr. M. runs a general wood-working establishment, making bee-keepers' supplies, house-fittings, and water-tanks. In fact, the factory can turn out any thing in the wood-working line except boats. Boats can be made, of course, as easily as a water-tank; but Mr. M. has a slight aversion to boating, and that department is left out of the establishment.

Mr. Mercer is aided, in his various operations, by four stalwart sons, and it is a pleasure for me to introduce the whole family to the readers of Gleanings. Mr. and Mrs. M. are seated. The oldest son, Wm. Edward, stands behind Mr. M. The next oldest son, Herbert, is seated at the extreme left. Harry J. stands next to Edward; and Fred, the youngest, also stands with his hand upon his mother's shoulder. The boys have all had more or less to do with the bees; but Wm. Edward, having taken to himself a helpmeet, and being especially proficient as a builder, devotes his time to his trade, and some of the finest residences in Ventura bear the marks of his skill. Herbert runs the factory, aided by the others when necessary. Harry J. is something of a photographer, while Fred, as Mr. Mercer puts it, is an all-round bee-keeper, and can handle more bees than any man he ever had in his apiaries. Mrs. Mercer, of course, lends a helping hand to all of the operations of husband and sons.

It will be observed that Mr. Mercer looks about as young as his boys, and it causes no little amusement in the family circle to have the "old man" often taken for one of the boys.

Mr. Mercer has made some fine exhibits at various fairs, and for a long time has had on exhibition in the Chamber of Commerce, at Los Angeles, a single comb (I estimate the size from memory) four feet in length by over one foot deep, with the name Mercer in large raised letters on the side of the comb, all made by the bees. This comb was also a prominent feature in Mr. Mercer's fine exhibit at the midwinter fair, where, I believe, he and Mr. Mendleson took the first premiums. Take it all in all, Mr. M. is an all-round man except in the matter of navigation.

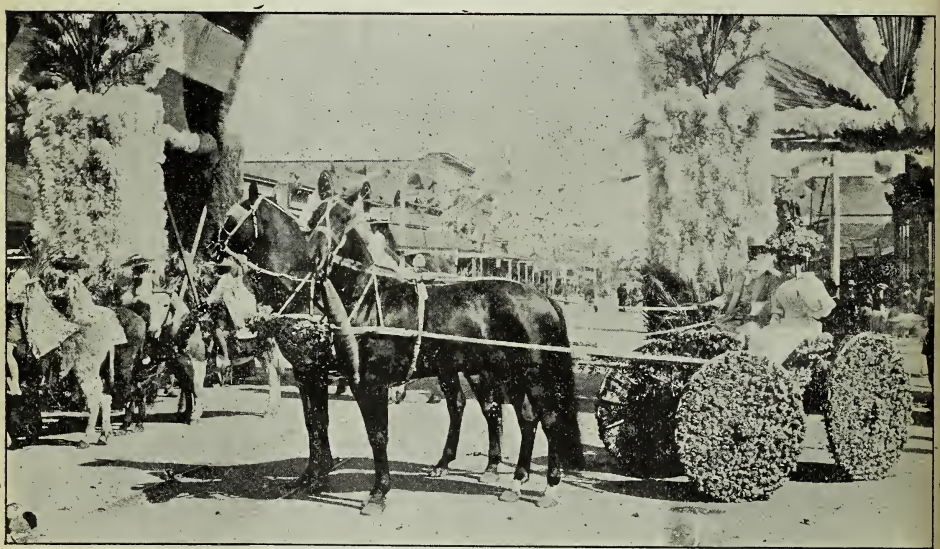
It may interest your readers to learn that those large water-tanks manufactured by the Mercers are in common use in Ventura Co. They are made to contain sixteen barrels of

L. E. MERCER AND FAMILY, VENTURA, CAL.

water, and are used for drawing water for domestic use, for irrigating fruit-trees—the whole tankful being put around one tree. The drenching supplies the needs of the tree for a long time. Mr. Mendleson uses one of these tanks, with his big team ahead of it, to draw water to his apiaries. The one recently illustrated among the eucalyptus-trees has a location several miles from water. Ventura Co. has a fine system of road-sprinkling, and that is where these tanks come in to bless the traveler, and no less the beast that aids him. Water-pipes run out 15 miles from town, and the water is taken from large stationary tanks located at proper distances, and the otherwise intolerable dust (so common in California) is subdued.

Bro. Wilder and I were pleased with all we saw in Ventura Co. The people are wide-awake and progressive, and none are more so than the bee-keepers. Ventura Co. bee-men are the most staunch supporters of our conventions, and, other counties doing as well, there would be more accomplished for the benefit of the fraternity at large. Several of the prominent bee-keepers were out to their apiaries—Mr. Wilkin, and the Rapp Bros. It would have been a pleasure to the Rambler to meet them again, and to test their sea-going qualities.

Our pleasures and adventures in Ventura, however, came to an end, and on June 25th we attached our ponies to the outfit, and, bidding good-by to our good friends, went on toward Santa Barbara through the beautiful Casitas (*kah-se-tas*) Pass. We enjoyed an ideal day and a delightful road, shaded with oak and sycamore, every little valley occupied with fruit-ranches, the trees loaded with fruit, and the environments of the dwellings blooming with flowers. We pass Carpenterea and Summerland, the latter town founded and supported by spiritualists. The location has a fine outlook upon the ocean, and a barren rear look upon the dry hills; and a conspicuous feature was the number of cottages for sale. Altogether, Summerland is better to read about than it is to witness. It is one of those towns that look well on paper; but a square look in the face of it dispels many of the anticipated pleasant features. We camped not far beyond Summerland, and the foliage of an old neglected olive-orchard protected us. The bees were merrily humming upon the trees in the early morning. It would seem that this would be a good bee-country; but it seems that there are but few domestic bees in this vicinity.



FLOWER FESTIVAL, SANTA BARBARA, CAL.

We spent a few hours during the day upon the streets of Santa Barbara; viewed the people, the Old Mission, and the elegant flower-bedecked and behidden private residences, giving hints of wealth and ease. Santa Barbara is not much of a center for honey interests; but it is a center for the beautiful flowers, amongst whose petals the bee loves to revel. Annually Santa Barbara convenes for several days of pleasure in a flower festival. Flowered arches spring across the street; flowers bedeck man, beast, and vehicle; the scent of fragrant flowers is in the air, and all business is dropped for the pleasures of the day. The great festival had transpired many weeks previous to our visit; but to know that Santa Barbara is a devotee of the flower, as well as the busy bee, is a pleasure to the Rambler.

LARGE VS. SMALL HIVES.

SHALL WE DISCARD THE EIGHT-FRAME FOR A TWELVE-FRAME LANGSTROTH?

By Dr. C. C. Miller.

It seems I am not to be allowed to sit comfortably "on the fence" in the matter of small vs. large hives. Here comes M. D. Andes, of Bristol, Tenn., prodding me with a sharp stick, to make me get down on the side of large hives. While conceding that every locality may have its own laws, he seems settled as to what is right in his locality. His bees are Italians, and he works for comb honey exclusively. After a success with ten-frame hives, he changed to eight-frames, and, after two years, with not so much success, he changed half his colonies back to ten-frame hives to compare results. About the same time he purchased 7 colonies in twelve-frame hives, and concluded to test them with the rest. The management of each was the same, only there was a little difference in surplus arrangements. Root's dovetail super was used on the eight-frame hives, as also on part of the ten-frames, while the remainder of the ten-frame hives and all the twelve-frame had wide frames holding eight one-pound sections.

He writes that the ten-frame hives gave him a third more surplus than the smaller ones, and the twelve-frame twice as much. He says, "This has been the worst season we have had for many years, and but for my ten and twelve frame hives my crop would have been 12 lbs. of comb honey from 20 colonies in eight-frame hives, while I got 30 and 70 lbs. from the best of the ten and twelve-frame hives. . . . Another *very* important thing. An eight-frame colony will swarm twice to a ten-frame's once, and the twelve frame colonies won't swarm at all. Of the 7 twelve-frame colonies, only one has swarmed in three years."

Now, it would be bad enough to give up the comfortable eight-framers for ten-frame hives; but, to think of having to lug around twelve-frame hives! Horrible!

What has been asked for is the actual results after fairly testing the two side by side. So far, only those have reported who have done better with the larger hives. At least, I don't remember any others. Now, won't some one give me comfort by sending in a different report—something like this? "For three years I have carefully tested, side by side, 15 colonies in eight-frame hives, 15 in ten-frame hives, and 15 in twelve-frames, and the average yield from the smaller hives has fully equaled that from the larger."

NUMBERING HIVES.

I have my hives numbered straight along in rows. If no numbers are on them, I can tell quite readily the correct number by noticing the place in the row. But I like to see the numbers on the hives; and when hives are put in the cellar it's absolutely necessary to have numbers on them if any track of their history is to be kept.

During the summer, hives are often changed from one stand to another, but it's the stand that holds the number; and if a hive changes its stand, it must change its number also. On setting out in the spring it is often desirable to set a hive on a stand different from the one it occupied in the fall. So the numbers on the hives must be changed. During the past summer the bees did so little that there wasn't any need of watching the numbers closely; so, many of them remained unchanged till fall. But they'll go into the cellar rightly numbered, and a good bee-keeper wouldn't like to leave them in such a slovenly shape through the summer. Most years I keep the numbers straight all the time.

As the numbers are changed so often, it is important to have an easy plan for it. I have pieces of tin 3½x2 inches, painted white, then the figures in black. A hole is punched near the top to drive in a half-inch wire nail. You will see that it's an easy thing to take one of these tags off a hive. Just slip a screwdriver under the tag close to the nail and pry it off. A light hammer can be used to drive in the nails, but I generally use a screwdriver. I don't drive in the nails—just push them in. Hold the nail between the thumb and finger of left hand; push the edge of the screwdriver between the same thumb and finger against the head of the nail, and, while pushing hard against the nail, keep the thumb and finger holding tight to the nail, so it can't turn to one side or the other. You'll find it isn't hard work to push the nail in, and you'll not make the bees cross, as you will by hammering.

CROSS BEES.

Speaking of making bees cross, my bees were very cross two or three years ago. I hardly know why. This year they're very good-natured. I hardly know why. It must be in the bees themselves, for this is one of the poorest honey years I ever knew, the time of all times when bees ought to be cross. The only reason I can think of is, that I have made it a practice for the past few years to kill the queen of any colony that showed too much bad temper. In an apiary of a hundred colonies, two or three cross colonies will furnish enough stings to make it appear that every colony in the yard is savage. I am just a little inclined to the opinion that a queen has an influence upon the temper of a colony, independently of the kind of bees she produces. When I've killed the queen of a cross colony, I've noticed that I didn't have to wait till there was time for all the bees to be changed, but that the bees were good-natured before the new generation came on the stage—at least it seemed that way. We know very well that a queenless colony is generally crosser for its queenlessness. When it receives a

queen it becomes good-natured. That seems to teach that the presence of the queen makes a difference in the temper of the bees. Is it altogether unreasonable to suppose that one queen will not make exactly the same difference as another?

Marengo, Ill.

[Perhaps some of our readers are becoming tired of this hive question; but I think it is an exceedingly important one, and I do not believe we can afford to drop it just yet. What we want is more facts. Let us hear from both classes of bee-keepers—those who find they can produce more honey with a larger hive, and those who can do better with smaller hives—at least, secure just as much honey with less labor in lifting. It seems to me that A. F. Brown, in the article on page 796 did pretty well with the eight-frame hive—that is, two eight-frame bodies, one on top of the other, when he produced 52,000 lbs. of honey from 193 colonies, or an average of over 269 lbs. It is true, there are larger averages from other bee-keepers, in the same locality, and it is possible that they used a larger hive. I wish Mr. Brown had told us the size and style of hive used by each in his enumeration of the large yields of the different bee-keepers. But after all, suppose it should turn out that some of those who secured larger averages used larger hives; does that necessarily prove that they produced 100 lbs. of honey with less labor, if we consider the fun of handling—that is, the lifting of twelve-frame hives and Long-Idea hives?

I have a sort of feeling myself, however, that the larger hives will produce larger averages (and they ought to, surely) per colony; and I presume that, when we get up as high as the twelve-frame size, swarming will be reduced to a minimum, and here indeed must be a saving of considerable labor. But I will stick to it yet, that I do not want to lift twelve-frame hives full of bees and honey. I would rather lift it half at a time. If a twelve-frame is better than a ten-frame hive, is not a sixteen-frame better than a twelve-frame? and if a sixteen-frame capacity is right, then the eight-frame is all right as it is. Two hive-bodies would be far easier to handle than one twelve-frame.—Ed.]

HIVES VS. HIVES.

THE IMPORTANCE OF A BROOD-NEST SUITED TO THE SEASON; A WELL-WRITTEN ARTICLE.

By C. W. Dayton.

Editor Gleanings:—In regard to this hive discussion which has been going on, I would say that it may not be so much holding upon the amount of brood there *is* as upon how much brood there *is not;* or, how well the bees work at honey-gathering.

I took a trip along the San Bernardino range of mountains after sage bloom. In one apiary, near Calabassas, one colony in an apiary of 140 had stored two supers of comb honey, while the rest had done hardly any thing. Near San Fernando, 12 miles farther east, two or three colonies stored their supers full for extraction, probably 40 lbs., while the rest of the apiary had done nothing. Ten miles farther east, only half a dozen filled their hives for winter, out of an apiary of 200. Six miles farther comes to a part of my apiary where 56 colonies gave two 21-lb. supers of faultless sections, and a 20-lb. super for extraction—not a variation of 10 lbs. in the whole batch.

A friend, who secured 150 lbs. to the hive in 1888, knowing that I sometimes write for the bee-papers, said, "Now, I can make a big report as well as you." I asked him to find one of my reports, either big or little—I should like to see it. It seems that, with all his reading, he did very little *thinking*.

There is no mistake that this has been a far worse season than common. In such seasons, even the instincts of the bees seem to change. Before sage bloomed they received so little outside encouragement that they became low-spirited and disheartened, but, through force of habit, kept up a small supply of brood at the expense of old stores. Then when sage bloomed they occupied two weeks at little more than gathering courage, and then used the remainder of the harvest in extensive brood-rearing. The flow of honey was so light that, with plenty of space, there could be used up in brood the next four weeks of gathering. Bees are like shoemakers, printers, and railroaders—prefer to stay at their old occupation. If they are slightly attracted from it they eventually get back again. So the principal drift of energy this year was brood-rearing. The queens knew nothing of the scarcity of rainfall last winter. Their business was egg-laying, and it devolved upon the bees to care for them. The first aspiration of bees being brood-rearing, they lay up a winter store with no more design than cattle move forward to pastures green—a thing they seldom do until present pastures fail. The reason pollen or honey accumulates in the combs at any time is because a large proportion of bees are too old for nurses, and have cultivated the gathering habit. In seasons of scarcity, brood may consume all they gather until the latter end of the flow, when there comes a superabundance of old bees, or more than the queen could keep occupied caring for brood. This may depend upon how long the flow lasted, or how weak the colony was at first, and how large it became at the end. About this time the bees conclude that, if the queen's wants are supplied, they will be content. There is many a man who would accumulate a fortune if he could scrape up the dollars by the measureful; but when it comes to delving for a "copper" here and there, he takes readily to the corner dry-goods box. If the habit of delving for coppers were cultivated, it might grow upon him.

It is not so much matter as to how many tons some one has received, as *why* these individual colonies so far outstrip the rest of the apiary. And, even in their case, might not their condition be varied so that they would have done even better? When we are able to produce

individual colonies we may then have individual apiaries.

Mathematically, the ten-frame Langstroth hive has capacity equal to the capacity of the queen, and 30 lbs. of honey. In my hive the honey is left off by making the frames 4¼ inches shorter, or 9¼x13½. These are strictly brood frames. At the beginning of this season it was determined that, if there was no honey stored, there should be very little brood reared. Accordingly I prepared to go to an extreme measure by transferring the colonies into brood-chambers exactly ⅜ the size of the standard ten-frame L., just about half the space the average queen will occupy with brood. They were kept in prosperous condition by feeding, and gotten as strong as possible in as short a time as possible, and transferred as near the commencement of the sage-bloom as could be determined. This is contraction and expansion; but the adoption of any certain hive for all seasons, some of which are very good and others correspondingly poor, is tramplike, because tramps stick heedlessly to the railroad, around curves, thick and thin; but the intelligent traveler secures many shorter across-the-country cuts: and when the long way around is the easiest, he takes it. This year, colonies which attained a rousing strength in large hives were too late for the harvest, for the simple reason that there was no encouragement to build on except the harvest. Then when strong, honey did not accumulate, because it was hard to get. But there was enough gathered for the brood. They would give their dear lives to save the brood, and they will also give nearly as much to extend the comb-space to suit the laying capacity of a good young queen. There is said to be much energy in a newly hived swarm. In the case of a swarm it is unsteady and short, and all the more so if the swarm has an old queen; but in the old colony, with young queen, striving for breeding-space, the energy clings with steady, everlasting grip so long as the new combs are removed, making the brood-space incomplete. Honey was so scarce this year, that, to deprive the bees of their brood or deprive the brood of the old bees, was destruction to both parts. Out of 20 or 30 swarms hived, only four were a success, and these were fed before and after swarming. Where they did not abscond they eventually played out. So in beginning the season with 133, and having over 90 swarms, I ended with 125 colonies, then increased 35 artificially.

Before the harvest I sold a neighbor 25 colonies, the best he could pick out. He *enlarged* the hives one-half, and transferred the bees about the time I *reduced* my hives one-half. He got no surplus, but increased, by natural swarming, to 45 colonies. Then he felt jubilant. Since then he has lost, by starvation and absconding, 22 colonies, with bright prospects of losing more. This was three miles away.

Another, who has taken as much as 35 tons in a single season, said he thought I was "off on the contraction of hives in California." He was located one mile away. We visited forth and back, and, as he came once in about ten days, I removed a super from a number of the contracted colonies until he saw four 21-pound supers taken from each, and more empty sections put on. He had been particularly bent against section honey. The last time I was at his apiary, seeing a quantity of sections, supers, separators, foundation, Daisy fastener, and Danzenbaker boxes, I asked if he was going to enter the supply-business. He said, "I am going to try your contraction." And this, right on the tail of the harvest!

Thirteen bee-keepers out of a dozen care very little whether their hives are adapted to the requirements of the one-pound section; but it is amusing to see the pieces of plank, boards, shingles, shakes, shavings, and newspapers they will utilize to conform their hives at times.

Still another remarked: "Why, it would not matter what kind of queens a contractionist had, with such small hives."

Yes, sir. I want just as prolific queens as can be reared. The more space the queen wants, the more I can intrude upon her domains with my section-boxes. The bees know a prolific queen better than we, and manifest such knowledge by supersedure and building worker comb, even when the queen is not "on the spot" to deposit worker eggs. Therefore the bees will extend their energetic work farther from the brood. Although the combs are built for brood, the queens were excluded and the combs were slowly filled with honey as an instinctive recourse. When the combs are removed it threw them back as much in want as at first; and as the outside row of sections were seldom finished they were placed in the new super as a starter or bait.

Too large or too small a hive would decrease the yield by increasing the brood or failing to put a new force of workers upon the stage of action as rapidly as the old ones went off.

It is one thing to get a hive full of brood, but a different matter to make bees work. They are more than willing to rear brood; but to store honey beyond the wants of the brood is not a part of their ambition. That they are able to gather far more honey than they do is plain to be seen. For instance, take a swarm weighing 5 lbs. A bee weighs a grain and a quarter, and carries a grain of honey. Then one trip for honey equals 4 lbs. Eight trips a day equals 32 lbs., and for a forty-days' yield, as we had this year and last, they should carry over 1200 lbs., not to speak of those bountiful seasons when six blossoms yield a load, and a trip takes only a few minutes. A prevailing idea is, that in these dry seasons the sage-blossoms contain no honey. This is disproved by the fact that some colonies do well. Again,

there was a rank sage growth, though not so numerous a growth of shoots as in the more favorable seasons. It does not seem reasonable that a plant could make a thrifty six-foot growth and yet fail in furnishing a most minute drop of nectar. Last season the honey, when first gathered, was thick; this season, thin and watery, showing that there was moisture, at least; and a grain of honey could be dipped from white sage, by hand, in less than an hour.

Florence, Cal.

[The article by Mr. Dayton is exceedingly well and carefully written. I would emphasize especially the point he makes regarding the desirability of the right size of brood-nest for the kind of season. He shows very plainly that too large a brood-nest for some seasons is a waste; for he says that "this year, colonies which attained a rousing strength in large hives were too late for the harvest;" and further he says, "Too large or too small a hive would decrease the yield by increasing the brood or failing to put a new force of workers on the stage of action as rapidly as the old ones went off." Therefore we must consider the fact that localities vary, and seasons also vary in those localites. Of course, the advocates of large hives will claim that their hives can be reduced. Granted; but there is a lot of extra wood and extra weight, extra cover, division-board, and what not, that *must* be handled with this small colony. Now, it seems to me that eight frames is as small as most beekeepers care to have a brood-nest; and twice eight frames, or one on top of the other, is as large as unusual seasons or unusual localities will require for brooding. Then there is the attendant advantage of handling a small hive when only a medium-sized colony is wanted.—Ed.]

AVERAGING A BARREL OF HONEY PER COLONY.

SOME TREMENDOUS YIELDS FROM THE STATE OF FLORIDA.

By A. F. Brown.

Friend Root:—In compliance with your request I herewith hand you my report for the past spring and summer.

My total crop is a trifle over 26 tons, from 193 colonies in yard. Of this 26 tons, 4½ was comb honey, principally in 12-oz. sections. Five tons of this crop was "orange" honey, secured at Glenwood, Fla., during March; the remainder, 21 tons, from palmetto and mangrove, secured by moving the apiary 50 miles to the east coast, upon what is known as the "Mosquito Inlet" belt of black mangrove. This belt of mangrove represents an area of country about three by fifteen miles in extent, and there were about 2000 colonies upon the range this year, the total crop being not far from 150 tons.

A few of the heaviest yields are: Harry Mitchell, of Hawk's Park, 56 colonies, 52 bbls.—an average of 380 lbs. per colony; W. S. Hart, of Hawk's Park, 116 colonies, 344 lbs. per colony; John Olson, New Smyrna, 38 colonies, 25 bbls.—about 275 lbs. per colony; Mrs. E. A. Marsh, of Oak Hill, 98 colonies, 305 lbs. per colony; T. M. Adams, Oak Hill, 70 colonies, 340 lbs. per colony; E. O. Clinton, Oak Hill, 80 colonies, 40 bbls.—550 lbs. each; about 275 lbs. per colony; John Y. Detwiler, New Smyrna, 13 colonies, 200 gallons, and heavy increase (in justice to Mr. Detwiler I should add that his colonies were hardly more than mere nuclei at the commencement of the season); E. M. Storer, Hawk's Park, 275 colonies, 90 bbls., and about 2000 lbs. of comb honey; John Abbott, Eldora, 26 colonies, 10 bbls.; J. P. Turner, Eldora, 17 colonies, 2½ bbls., and increase to 50. Messrs. O. O. Poppleton, R. S. Sheldon, S. A. Galbreath, and many others, secured good crops; but I have not the exact figures to give in this.

The apiaries in reach of both palmetto and mangrove are the ones which gave the biggest yields; but those in reach of only one source did well for that, but do not count in the aggregates. Again, some men use only a two-story eight-frame hive, whereas others used three-story ten-frame hives; still others, the "Long-idea" hive.

Some allowed their honey to remain upon the hive until all sealed and thoroughly ripened by the bees, while others ran their extractor twice a week, and harvested "sweetened water" instead of good No. 1 honey. This is very noticeable with those who secured the "big" yields.

Again, some extracted so close that their bees will regain a good share of it back before they will meet with any more coming in. Others left 50, 75, or 100 lbs. in their hives. All these items figure in, and materially change the face of many of the yields.

Summed up as a whole, I think 200 lbs. per colony, and ample stores left within the hive, to be about correct for average good colonies. I have no record of the largest yield of extracted from one single colony; but I had several colonies that gave me from 290 to 312 lbs. per colony, of comb honey in 12-oz. sections. Mr. E. M. Store and myself are the only ones who worked for any comb honey. All others ran for extracted.

I might add, that I used a two-story eight-frame hive, my frames being the original Hoffman, as invented and used by Julius Hoffman. I used no division-boards; the inside width of my hives being 11⅝ in., frames are 1⅜ in. spacing. Propolis does not interfere with rapid work; on the contrary, it is quite valuable when migration is followed.

With honey off the hives, and in the extracting-room, I have, with one assistant to help, uncapped and extracted five 45-gallon barrels in 4½ hours, using one of your two-frame Cowan extractors. All my honey remains upon the hive until sealed. I use two Bingham knives, heated, for uncapping.

This is my third year following migration, and my sixteenth move, covering distances from 5 to 300 miles, with from 100 to 300 colo-

nies. Since the close of the mangrove season I have moved my apiary to this place, a distance of 75 miles, and placed it in reach of some 60,000 acres of swamp, and 2000 acres of orange-groves, ready for winter and spring flows. I am well acquainted with every nook and corner of East, Middle, and South Florida, and the honey resources all over the State, having compiled the State Reports for three years. I have visited and investigated Cuba and her honey resources, and could add several items to Fred O. Sommerford's article in Sept. 15th GLEANINGS, but space forbids.

San Mateo, Fla., Sept. 23.

[When A. I. R. was visiting at Mr. Langstroth's, in Dayton, the latter told him that he had received a report from a bee-keeper in Florida who had averaged a barrel of honey per colony for his whole apiary. When the senior editor came home he wanted to know if I had received reports of any such yields. "Why, yes," I said. Our Honey Statistics had given an inkling of something of the kind, but did not put it exactly that way. He thought we ought to find out more about it at once. But I suggested that these big yields were sometimes misleading, and that we must not make too much of them. But Mr. Brown has written the matter up in such a way that I do not think there will be any wrong idea conveyed. We must remember that yields per colony in the South (and that includes Cuba) are much larger than those in the North; so we must make due allowance for locality. While most bee-keepers of the North have been reporting a rather poor season I am sure they will all rejoice with their bee-keeping friends in Florida who have produced such enormous yields, even aggregating a barrel per colony, if we consider the barrel as one of standard size—31 gallons. Larger honey-barrels are unwieldy to handle, so the smaller sizes are usually meant when spoken of.

I have been a little fearful that the Hoffman frame might not be satisfactory in the extreme South, where the propolis is deposited more freely; but it seems that, if one will throw aside his old-time prejudice, and really open his eyes to something better, he may handle these frames to better advantage than the loose unspaced style.

I scarcely know what is a big record for extracting—that is, the largest number of pounds taken out in a given time; but I am rather of the opinion that five 45-gallon barrelfuls, or 2500 lbs., in 4½ hours, is a record-breaking feat for a two-frame extractor. Here is a pointer for those who are using the non reversible machines.

The rest of my footnote will be found attached to the article of Dr. Miller's, p. 793, and to which friend Brown is referred. I hope he will not only give us the information called for, but the "several items" in reference to Mr. Sommerford's article in GLEANINGS for Sept. 15.—ED.]

RIPENED OR DIGESTED NECTAR.

CROSS (?) OF CALIFORNIA.

By Prof. A. J. Cook.

I read last GLEANINGS with sincere pleasure. The new ideas regarding feeding by percolation, from Dr. Miller and Mr. Boardman, pleased me much, as I am working on the same line. I am free, and rejoice to say that they are ahead of me. I was amused to hear of Mr. Boardman's experience, that it did not granulate as the "bees ripen it." We usually speak of ripening as a thickening process, and we all know that, the thicker cane syrup is, the more readily it crystallizes. Why not speak the truth, and say the bees digest it, or convert it into honey—a glucose sugar? Mr. Muth says it is cane sugar stored. Why, then, does it not granulate or crystallize?

I did not say in my article that the so-called paralysis was caused by too little stores. I see no reason to change my mind regarding the new bee disease.

We have heard much of cross bees in California, or, rather, that the California bees are peculiarly ill-natured. My present bees are hybrids, between blacks and Italians, with black blood in the ascendency. This season has been a very poor one. Such a combination in Michigan I used to dread, in case I had to work with the bees. I have not been troubled at all here. I have worked not a little with no veil, and often with no smoker.

People are often annoyed by having their shade-trees injured. Horses are hitched to the trees, and soon girdle and destroy them. I have a magnificent oak in my yard. It is immense, and its shade and beauty are our constant joy. Well, I have no sign up, and yet no one hitches to this mighty monarch. I believe the bees enjoy it as much as I do. It shades the bees, and me while I work with them, and I have little fear that horses will be tied to it.

I have been through Ventura Co. twice lately; but time would not stop nor listen to my stopping, so I passed Fillmore, Santa Paula, and Ventura, with great longings to visit McIntyre and our other friends. My regrets were renewed as I read Rambler's account of his and our good friend Wilder's visit in that region.

Claremont, Cal., Sept. 26.

[I do not think we can successfully deny that bees do do something to nectar or thin syrup after they get hold of it. Chemical analysis shows a slight change; and when honey or syrup is fed thin enough they ripen it or digest it, or do something to it that changes it somewhat. When syrup is fed thick, or in the old proportion of two of sugar to one of water, less change necessarily takes place—perhaps none at all in some cases; but when it is fed thin—half sugar and half water, after the bees have stored it in the combs it seems to have undergone a change. It looks a little different, and it tastes a little different. You seem to prefer the word "digest."* If there is a change, I should prefer the word "ripen." It seems to me it is more palatable to the consumer to think of it as such; but whether this ripening

*It seems incorrect to use the word "digest" in connection with nectar or honey until it has been acted upon by the true stomach for food. Not until then does it begin to disintegrate and start to build up that which is continually wearing away, by converting, in the language of Cowan, the nutrient particles of the food into blood. Nectar is held in

of thin sugar makes it really and truly honey in every sense of the word, is something I can not quite admit. Prof. Wiley's definition of honey seems to me to be correct when he says that it is nectar gathered from flowers, and stored by the bees; and chemically, if I am correct, it does not have *all* the qualities of honey from flowers; yet I am quite willing to admit that thin sugar syrup, if fed to the bees, and stored, will taste very much like ordinary honey; but I am opposed to calling it honey, for it has not gone through the legitimate process of being gathered from flowers.—Ed.]

NOTES OF BICYCLE TRAVEL.

By Ernest R. Root.

At the depot at Flint I inquired where W. Z. Hutchinson lived.

"Do you mean the editor of the *Review?*"

"Yes, sir," I said.

A small boy started me up the street, and ere long I was before the home of the *Review*. It was now dark; but after passing through the gateway I saw that some girls were swinging in the hammock under some broad-spreading trees. These proved to be the *Review* twins. One of them started for her father, and very soon a tall, stalwart figure, as straight as an arrow, dressed in work-clothes, appeared from around the house; and before he could see me distinctly he held out his hand with a cordial "How do you do, Ernest?"

He is one of those professional men who are not afraid to put on overalls, and to get right down to honest, hard day's work; neither is he ashamed to appear in his work-clothes.

We went into the house, and I was soon making the acquaintance of baby Fern. No wonder Bro. H. is proud of her. I had intended at this time to present here a nice picture of her; but I am sorry to say that the half-tone here shown doesn't half do her justice. It is sufficient to say that I took a "great shine" to her, and she to "that man," as she called me. The Hutchinson home was happy before she came; but it is doubly so now, I should judge.

Mr. Hutchinson and I soon fell to talking about photography—a hobby that we both pursue at times, with a great deal of enjoyment. The talk that followed for the next few minutes, regarding negatives, snap shots, and time exposures, probably would not be particularly interesting at a bee-convention, nor even here, and so I'll not repeat it. But while we were thus engaged, it seems that baby Fern did not care to go to sleep, in spite of the efforts of her mother. Finally papa was called upon to perform the task—something he did with entire success. Mrs. Hutchinson explained that, inasmuch as her husband had his office in the house, he had taken a good deal of the care of Fern, and sometimes she seemed to think that her papa was a little bit better than her mamma.* The case is otherwise at our home.

Next morning Bro. H. and I visited for awhile in the *Review* sanctum. He showed me some of the photographs he had taken illustrating the different phases of apiculture. In the production of clear, well-defined, sharp photos, illustrating bee-keeping, he certainly will carry off the palm.

As my stay was to be brief, we next repaired to the *Review* apiary. This, I saw, was made up of Heddon-Langstroth and Heddon divisible-brood-chamber hives.

As to the size of hives, Mr. H. did not express himself very positively; but seemed to think that the eight-frame capacity was large enough for his locality. As to dead brood, he had seen nothing of the kind in his apiary, but thought Mr. Taylor might be able to show me some. After taking a look at some of the Atchley five-banders, we turned our attention to the Atchley plan of keeping the surplus queens in small nuclei. In Mr. Hutchinson's hands it certainly was a grand success. There was no robbing and no killing of queens, and all were just as fresh as when taken from the hive in which they were reared; and if there is any thing in the statement that it is bad to

BABY FERN.

the honey-sac, not for the purpose of present digestion, but *possibly* to render it better for preservation, in order that it may be digested when the bee needs actual food in the true stomach to supply waste.

* Some time ago Mr. Hutchinson gave expression through his paper to the idea that, however well we might know our friends as bee-keepers, we like to know something of their home life, or how they live. I hope, therefore, I may be excused for giving this little peep into that most sacred of all places, a home. I shall give other peeps, perhaps.

take queens from the hive in the height of egg-laying. they are in better shape because their laying capacity is limited to the surface of two ordinary sections.

This plan was given in GLEANINGS for May 15, 1894, page 407; and in the August *Review* Mr. Hutchinson writes of it as used in his apiary, as follows:

Queens in large numbers are now being kept in the *Review* apiary by means of the Atchley plan. An old-style Heddon super is divided into eight compartments, three unfinished sections and a caged queen placed in each compartment, and the super placed over a queenless colony. The bees rush up and cluster around the queen and between the sections. Just at dusk the super is placed upon a bottom-board having a raised rim around the outside, also strips across the center to correspond with the divisions in the case, and carried to a new stand in some shady secluded spot. Each little compartment is furnished with an entrance cut through the rim around the outside of the bottom-board. A piece of queen-excluding metal, with a single opening, is placed in each entrance. Each little hive is furnished with a separate cover, and over all is laid a flat board cover. The next day at dusk the queens are released. I have yet to have a queen killed in one of these little clusters. Robbers give no trouble whatever. It isn't that they do not find the hives, as I often see them "snooping" around them, but they seem to hesitate about crawling through the perforated metal when there is any opposition back of it. This plan keeps the queens in the best possible condition for shipment, and enables me to keep a stock of queens on hand all ready for immediate shipment.

I was very enthusiastic over this new method of keeping queens, and determined to put it into practice as soon as I arrived home, but somehow I did not get around to it; but it shall be tried next year — not to determine whether it will work, for I am satisfied of that already.

I might say, by way of parenthesis, that A. I. R. tried these small nuclei many years ago; but he was continually bothered by their being either robbed out, or else by their swarming out of their own will. But you see the Atchleys have overcome both difficulties by reducing the entrance to the size of a single hole of excluder zinc. This is large enough for the workers to pass in and out, but just small enough to make it risky for robbers to try to get through and get out alive. Well, suppose the little colony, or, better, little nucleus, decides to swarm. All right—let it swarm. The queen can not pass the metal, and they will come back. But even if they should fail to do this, there will be bees enough left to take care of the queen.

After talking over some of our experiences in the line of getting out bee-journals we repaired to the barn, where I had left my wheel, and prepared for another run. Lapeer, the home of R. L. Taylor, was about 20 miles due east; but it was over a road of Michigan sand. As soon as I heard this I decided to take a train, and wisely too. On arriving at Lapeer I found I had only two hours between trains, for it was necessary for me to go back to Flint in order that I might take another train that would carry me over the ocean of sand to Manistee, Mich. Mr. Taylor lives about a mile from the depot, I should judge. It did not take me long to find his home, a handsome residence near the outskirts of the town. I wheeled into the yard, and there I met Mr. Taylor reading his morning paper, comfortably seated in an easy-chair on the lawn.

I explained that there were only two hours between the trains. Grasping the situation at once, he proceeded to make the best of the time at my disposal. So, just before dinner we took a ramble over his fruit-farm. I was surprised to note the extent, variety, and perfection of the fruit that he was growing. How often we know bee-keepers *as* bee-keepers, but are entirely ignorant of the fact that they have made successes in other lines of rural industries! So in this case, I think our readers will be glad to know that Mr. Taylor is not only well up on the subject of bees, but in fruit-growing—that is, if I may judge from the old rule, "By their *fruits* ye shall know them."

Well, after we had taken a stroll over the farm, my eyes rested on some queer sort of pits in a side-hill in a little grove. "What do those pits mean?" Mr. Taylor smiled a little, and remarked that the previous owner was a spiritualist, and that he had been informed by the spirits that a quantity of treasure was buried somewhere in this hill-slope. The numerous pits that had been dug here and there, only to be abandoned, plainly attested that the digger fully believed that the spirits had told him the truth. But Mr. Taylor, it seems, instead of going crazy over the same idea, when he came into possession of the land, dug the wealth out of the soil by a far more rational method; i. e., in the production of fine crops by the "sweat of the brow."

After dinner we employed the short time that was left us, in the bee-shop and apiary. In the former, Mr. Taylor showed me crates of honey, individual sections of which contained various kinds of foundation. The object of the experiment was to determine what make and what weight would give the most honey per section or per crate. It was plainly evident that the Given, as could be seen from the bulged combs which had been built from that foundation, was ahead, and that the combs from the Van Deusen flat-bottom was quite a little behind the other grades. This was shown by the fact that the combs in the last named were scarcely ever built out even to the face of the sections. "Why," said I, "Mr. Taylor, this is worthy of being carefully photographed, because a photograph can not be prejudiced, nor can it mis-

represent the facts." Mr. Taylor seems to have followed the suggestion, for a picture appears in the *Bee-keepers' Review* for September. Further reference will be made to this experiment, editorially, elsewhere.

We next turned our attention to foundation-fasteners and other fixings used in the apiary. Every thing about the shop betokened careful thought as to how labor in performing the various operations might be the most economically employed. He finally took his Bingham smoker and a large screwdriver, and was soon ready to look over the divisible-brood-chamber hives, the manipulation of which by Mr. T. I was very anxious to see.

As our readers know, he is a strong advocate of a capacity of eight frames—at least, for the Langstroth size; and when I fired the question at him again, he expressed himself as perfectly well satisfied with that size of brood-nest for the Langstroth frame. A glance over the apiary showed that there were a few old-style eight-frame Heddon hives still in use; but the great majority were of the divisible-brood-chamber type.

I then asked him whether he had seen any cases of dead brood in his yard. Yes, he had, and he very soon showed me some. We were speculating somewhat upon the difference between the dead brood that had visited some of the apiaries of late, and the ordinary virulent type of foul brood, when Mr. Taylor remarked:

"I think perhaps I have a sample of foul brood that we can look at."

"But," said I, "are you not afraid to open up the hives, now that the honey season is over, in the middle of the day?"

Foul brood had no terrors for him. He would just as soon have one or two cases in his yard, in order that he might study it. As he sells nothing in the way of bees or queens, the disease is not likely to get beyond his yard, nor, indeed, into the honey, considering the care with which he does every thing in the yard. Well, the marked difference between the foul brood and dead brood was, that the former was decidedly ropy. The latter looked very much like it, but lacked this one characteristic of ropiness—that is, that tenacious, sticky quality, that would cause the maturated mass, when perforated with a spear of grass, to adhere to the end of it as it is drawn out slowly, making a stringlike filament that breaks when drawn out an inch or so.

Mr. Taylor then showed me a hive that had shown traces of foul brood about a year ago. This he had left to its own devices to see what it would do. The disease would appear and then at times disappear. At the time of our inspection we found one or two diseased cells. This was an interesting case, as it illustrates how some colonies will resist the disease, without any serious effects.

Well, how about those Heddon divisible-brood-chamber hives? He handled them very expeditiously and easily, although they had been in use several seasons, I believe. After removing the cover, his next operation was to loosen as many frames as he cared to remove, by prying between the frames with the large screwdriver. Then the operation of withdrawing the frames was easy, and was done without any disturbance on the part of the bees; nor was there any bee-killing, that I could discover. Mr. Taylor is not one of those who bubble all over with enthusiasm when he is pleased with any thing; but in his quiet way he seemed to be perfectly satisfied with the Heddon hive.

I forgot to ask him whether he had any difficulty, as some of us have had, in getting the bees to breed properly in two shallow brood-chamber—i. e., from one to the other. My own experience with shallow chambers, as well as that of some other bee-men whom I saw on this trip, who had tried similar arrangements, seemed to indicate that, while the bees would breed all right in one section, it required pressure and considerable coaxing to get them to enter the next one, either above or below. I remember, when Mr. Taylor removed the frames, that there seemed to be brood distributed in both sections of the hives. That being the case, perhaps he can tell why he has no trouble along that line, or how it may be obviated. Perhaps something may be due to the race of bees used. And that brings me to the Taylor bees. I was surprised to see how well-behaved they were, despite the fact that, in one instance (I believe for a test of their temper), he removed the cover with a snap; yet they did not seem to resent particularly this intrusion. "Why," said I, "Mr. Taylor, you can not do that with some of our hybrids, much less those that are nearly black." I am glad to know that they are well-behaved. But the principal reason why they are preferred, I believe, is because they shake readily from between the combs of the shallow brood-chamber, and thus render more feasible certain operations with this sort of hive.

The five-banders were about the meanest bees in point of temper and robbing disposition he had, or, I believe, ever had had. All the time that I was in the yard the yellow fellows were following us about; and even while we were at a considerable distance from the apiary, looking over the fruit-farm, an occasional five-bander would buzz about our heads.

While thus pleasantly engaged in the apiary, I noticed that I had only six or seven minutes to get to the depot. I was soon on the bicycle, and in a few minutes more was on the train again for Flint, there to change cars (for it was Saturday afternoon) for Manistee, Mich., the home of an aunt.

To be continued.

KEEPING QUEENS.

Question.—What is the best method of keeping laying queens while not in use in colonies?

Answer.—There are only two reasons which I know of, why a laying queen should be kept outside of a colony of bees, except in the case of shipping them, where sold to a customer, or transporting them from one apiary to another. This exception is covered quite thoroughly in all of our bee-papers, for there is scarcely a month goes by but that some one has something to say in regard to sending queens in the mails, etc., telling of the best cage, the best candy to use, the right number of bees to put with the queen, and so on. With me, I use the small Benton cages for the month of June, July, and August, where the queens do not have to go over 1000 miles, and invariably give each queen ten bees to accompany her. In all cages I use the Good candy, no matter where sent. For spring and fall, and where queens are going more than 1000 miles, but not farther away than the United States or Canada, I use a cage of the Benton pattern, but about three times as deep, and with the queen I send sixteen workers as companions. These workers are bees from six to ten days old, or those which have had their first cleansing flight, as bees which have not flown to empty themselves of the accumulations collecting through their larval period are not in condition to endure confinement to the best advantage. Worker-bees are best caught and selected when they have their heads in the cells taking honey, and bees of the age spoken of above are far more likely to take honey when the hive is being disturbed than are those either older or younger, so if the operator takes the bees that have their heads in the cells, loading with honey, upon the removal of the frames from the hive, he is not liable to be far out of the way in his selection of bees to ship as companions with a queen. Besides, such bees as have their sacs well filled with honey seem to stand the journey much better than bees taken with empty honey-sacs, as I have proven during the past ten or twelve years. My way of accounting for this is, that this honey taken with them helps them to moisten the sugar in the candy, so the candy is more readily used than where they have no honey to moisten it with; for it is a well-known fact with those who have fed candy to bees for wintering purposes, that, so long as honey remained in the hive, the candy would be moistened and used; but when the supply of honey gave out, the bees would often starve with plenty of candy within easy reach. Since I learned this fact, that bees filled with honey, when put into the shipping-cage, were more likely to go through in better shape than were a promiscuous selection, I have lost very few queens; and the past season has been one of unusual success, as only one queen out of every 164 sent out has been lost, so far as reports have come in. For shipping to foreign countries, I am still "at sea" regarding just what the cage should be. This year I have been placing a piece of dry worker-comb in each cage, from the fact that more queens are lost by being drowned or daubed, with the feed getting thin and running all over the inside of the cage and occupants, than from any other reason. This seems to come about by the dampness which accumulates on the candy while on the ocean, the mail-bags being crowded in some damp part of the ship. We all know that, where the bees are "at home" in their hives, they always store any sweet liquid found loose anywhere about the hive, in the combs; and as the queen and accompanying bees soon establish a "home" in the shipping-cage they are confined in, this dry comb will give them a place to store the liquid produced from the moisture coming in contact with their candy. More than this, it will allow the bees which have their sacs full of honey when put into the cage, to store that honey in this comb, instead of holding it in their sacs, and thus they are placed in as nearly a natural condition as possible while *en route* for foreign countries. I put in 30 bees to accompany the queen to foreign countries. But perhaps I have dwelt too long on the exception part of this matter; yet I did not see where to stop, and yet have it plain to the beginner. One of the other reasons for desiring to keep queens outside of the hive is, where we wish to take the reigning queen from a hive in order to introduce another, or take one from a nucleus to make room for cells which must be taken care of before they hatch. It is always well to preserve the old queen when we are trying to introduce another in her stead; for, should it happen that the queen which we are desirous should supplant the old one is lost in introducing, then we shall not be obliged to leave the colony queenless, as we have the old one on hand to give back to them; or we can give one of those taken from the nucleus, if preferred, to take the place of the lost one, if all these have not been sent off to customers. To keep such queens as last spoken of, I use two methods. One is, to put them in cages with accompanying bees, the same as for shipment, placing the cage where a temperature of from 60 to 70° can be maintained, as nearly as possible, for this temperature is conducive to the longest life of bees while in confinement in a cage outside of a hive; and the second is, to place the queen in a provisioned cage without any worker-bees with her, placing the cage over the frames of a nursing colony; or, where several are thus caged, by

placing these cages in a frame made to fit a certain number, said frame to take the place of one of the frames in the hive. The one cage can be placed in a frame if it is thought better for the queen to be down among the bees, by making blank cages to fill the frame. Make as many blanks as your frame will take cages, and then when you have queens to put in, remove as many blanks as you have cages with queens in, and you are prepared at all times to accommodate as many or as few as may be desired. The nursing colonies are made up of five or six frames of hatching brood, and are kept well stocked with young bees, which are not permitted to have a laying queen while used as a nursing colony. My advice would be, not to keep any queen away from the bees or combs, where she can lay, for more than three weeks; for I believe longer confinement tends to the injury of the queen. The last reason for desiring to keep queens outside the hive is, the prevention of increase while securing a crop of comb. A large increase of bees and a crop of comb honey do not go together; and for this reason many of our best bee-keepers practice the removing of queens from the hives when the swarming season arrives, and in nine or ten days destroy all queen-cells and return the queens, when the bees are said to go at once into the sections, and no trouble with swarming results. While I do not fully indorse this plan, yet I have had the best of success in this way some years. In others the bees would contract the swarming fever later, and swarming became a source of annoyance to me. Where queens are to be kept for this purpose, I consider it best to take her out with a frame of bees and hatching brood, putting the frame of brood into a nucleus hive above or close beside the old hive till wanted back, when she is easily replaced by setting the frame back.

[One of the best methods of keeping a queen while out of the hive is the Atchley plan of using very small nuclei, containing one or two sections, with an entrance consisting of only one perforation of excluder zinc. The plan is described in full in another column in Notes of Bicycle Travel.—Ed.]

Heads of Grain, from Different Fields

A CORRECTION.

In my article in Gleanings for Sept. 15, on "Work in the Apiary," I find a couple of errors, the correction of which will give a better understanding of my meaning. P. 721, 2d column, 15th line, "No. 2" should be *No. 72*. In the concluding paragraph you make me say .... "I have several times forgotten the stopper for a few minutes, or until I needed it the next time." In the "copy" I wrote "or until I needed it *at the next hive*." "The next hive" may be only a few steps away. "The next time" *may* be next day or next week, which would prove rather disastrous to the colony where the entrance-stopper was left.

Wm. Muth-Rasmussen.

Independence, Cal., Sept. 28.

STATISTICS.

Alabama.—"Sorry."

Arizona.—Very good. Mr. Gregg gets 25,980 lbs., 200 colonies.

California. — New Rosedale, extraordinary; one apiary of 300 colonies averages 150 lbs.; good in Sierra Co.; at Independence, very poor.

Colorado.—Very favorable at Las Animas, 85 colonies giving 5000 lbs., 3000 of it comb; at Fort Morgan, Aug. 27, there was a big crop, and still coming.

Florida.—Very good at Vero, 50 colonies giving 10,000 lbs., one colony giving 450 lbs. extracted; poor at Wewahitchka.

Georgia.—Very good in the northwest part.

Illinois.—Favorable at Osage; bees "down" at Jerseyville.

Iowa.—August reports are all bad; much better in September.

Kansas.—Failure.

Maine.—"Best we ever knew," etc.

Maryland.—Very good in Garrett Co.; poor in Queen Anne's Co.

Michigan.—Very poor in Hillsdale Co.

Minnesota.—Two report good, one bad.

Mississippi.—One bad report.

Missouri.—Aug. 20, very poor.

New Mexico.—First failure in 12 years.

New York.—Five report favorable, two not. Julius Hoffman reports "poor in quantity and quality."

Ohio.—Both extremes are reported.

Pennsylvania.—Good from buckwheat in Juniata Co., Aug. 21.

Texas.—Two report good, one bad.

Utah.—Very unfavorable.

Virginia.—"Poorest season in 20 years," one reports.

Washington.—Best in 15 years at Elberton; very poor at Mossy Rock; fair at Port Angeles.

Wisconsin.—Two good reports, but generally rather bad.

[As the reports above were written somewhat later than those given Sept. 1, we see a decided improvement after the drouth was broken the first week in September. In some respects it has been a year of great extremes in regard to rain, and, consequently, as affecting the flow of nectar.—Ed.]

RIDING A BICYCLE; SOME QUESTIONS FROM PROF. LAZENBY, OF THE OHIO STATE UNIVERSITY.

Mr. Root:—I read with equal pleasure and profit your notes in Gleanings, especially your reports of long-distance rides on the bicycle. I should like to ask you a few questions.

1. Does riding a wheel demand so much attention that one can not observe with satisfaction, or follow a continuous line of thought?

2. How does the use of the bicycle affect your walking? Does it lessen your inclination or pleasure in this exercise?

3. Do you sit perfectly upright on your wheel, or do you adopt the common spider or racing position? If you use low handle-bars, and bend forward, do you regard it as injurious? Do the advantages of such a position overbalance the disadvantages?

I have never used a wheel, but am thinking of doing so. Before beginning I desire more light on the above points. I believe I realize the advantages of the bicycle. They are many

and evident. The disadvantages are not so evident, and I should like to know what they are. WILLIAM R. LAZENBY.

Columbus, O., Sept. 3.

[1. While learning to ride, it usually takes about all the beginner's attention to keep his seat and stay in the road; but in a very little time it becomes a sort of involuntary work, like walking; and the most of my work for GLEANINGS is planned while riding. In fact, I sometimes go into a deep study over some problem, and ride miles without noticing very much of the country I am going through, unless something unusual wakes me up.

2. The use of the wheel certainly makes one feel more like walking: and I often enjoy walking beside my wheel, up a long hill, as a change. When I overtake a friend who goes along with me for a piece, I usually walk, for it is difficult to ride the wheel slow enough to keep pace with one on foot. I enjoy walking for a change, and afterward I enjoy the wheel again for a change.

3. I always sit upright, unless it is during a high wind or when climbing a long steep hill. While the bent-over position is certainly very much of a notion, there are some circumstances in favor of it when one wishes to make the greatest speed possible. The principal one is that to which I have already alluded, offering less resistance to the air, especially when the wind is against you. I do not know how any one can, from choice, adopt a bent-over posture any more in riding than he would in walking or sitting down. So far as my observation goes, it is mostly the boys who ride bent over, and those who seem to ride only to make great speed. Where one rides for the pleasure of it, to see the country and to study nature, as I do, he certainly will prefer to sit upright.—A. I. R.]

SINCE I have discarded that editorial "we," somehow I feel more natural.

IT is reported that foul brood is raging badly in Hunterdon Co., N. J. By the way, localities where foul brood is prevalent should be known, it seems to me.

REPORTS are beginning to agree that the most effective remedy for the cure of bee-paralysis is the removal of the queen. In the worst cases, nothing seems to do any good.

BEE-KEEPING IN ONTARIO.

FOR at least once, the bee-keepers have a fair show at the hands of the press. The *Toronto Globe* for Aug. 25 devotes about two pages to honey and bees, illustrated by over a dozen large and fine views. Among those representing bee-men we notice those of A. Pickett, R. F. Holtermann, Wm. McEvoy, Wm. Couse, and Martin Emigh. The subject-matter treats of the number of hives in Canada and other countries; honey—its source and peculiarities; how to secure it; hives and their construction, etc. The remarks on fertilization, with illustrations, are excellent. I am glad to see this new departure, not only in journalism, but on the part of the bee-keepers themselves, in rendering such matter available to our large dailies. Are not the bee-men themselves to blame in not furnishing more apicultural facts to their local papers instead of confining them to the bee-journals? Let the good work go on; and I am not at all sorry that our Canadian friends have "set the initiative."

PERCOLATOR FEEDERS; MAKING SYRUP IN LARGE PERCOLATOR CANS, SYRUP TO BE FED IN THE ORDINARY WAY.

WE have been continuing in the use of the crock percolator, as described on page 769. They are still working nicely; but to test this plan further, we have been trying it with different kinds of receptacles. Where we desire to feed the colony up with one feed, or, at most, with two, the two-gallon crock is a little too large and unwieldy to be handled easily, for the crock itself forms no inconsiderable part of the weight. Looking over our counter store, my eyes lit upon some sap-pails.* "There," said I, "here is just the thing." These were filled with sugar and water, half and half, and then a shallow cake-pan was set over, with three or four thicknesses of cheese-cloth between. The whole was then inverted. But the flaring edge of the cake-pan fitted so close to the rim of the pail that it took the bees five or six days to get the feed out. This would be all right ordinarily; but as it was getting to be a little late we desired to feed a little more rapidly. Instead of the cake-pan we finally substituted square pine boards ⅞ thick, just large enough to cover the pail. These would warp enough to let the air through the cloth, and consequently the feed would run out the more rapidly. These the bees empty in from one to two days, and are then ready for another feed. The fact that the board is warped a trifle does no harm; but it should be stated that the crocks or pails, whichever are used should be filled level full of sugar and water, otherwise the slight amount of air will allow some of the water to run out before it has incorporated the requisite amount of sugar.

COLD-WATER SYRUP; B. TAYLOR'S PLAN.

Well, it was getting so late that we thought it inadvisable to continue the percolator feeders on the hives much longer, inasmuch as the syrup as fed was in the proportion of half sugar and half water—too thin for late feeding. Disliking to make syrup in the old-fashioned way (heating it and stirring it an hour or two to get the sugar thoroughly dissolved), I thought I would try the percolator plan, as it was said this syrup would not granulate, and would be of the proper consistency for late

*Of course, those with holes near the top rim for the sap-spile will not answer.

feeding in ordinary Miller feeders. Our neighbor, Vernon Burt, told me that he had used the plan described by R. L. Taylor, with entire success; that his whole apiary of 180 colonies had been fed without heating an ounce of syrup. The plan that R. L. Taylor described was given in GLEANINGS, page 496.

Briefly stated, it consisted of an ordinary Dadant uncapping-can. As most of you know, it is simply one can set on top of another—the top can having a false bottom of wire cloth, and properly stayed to hold up the center. Over this false bottom Mr. Taylor laid over three thicknesses of old bed-blanket, carefully tucking it around the edges. On to this he poured the sugar and water, and, in his own language, the result was all he could desire; for all he had to do was to keep the top can supplied, and draw off the clear limpid syrup from the can below. Of course, I naturally concluded that, if Mr. Burt and Mr. Taylor could make a success of this, we could. In the first place, flannel is rather expensive, so I told our apiarist to take six or eight thicknesses of cheese-cloth and put them into the bottom of the can. The sugar and water were put into the top can, and I eagerly awaited results, when, much to my disappointment, the syrup drained through but little better than sweetened water, and five pailfuls in only two hours. It ought to have taken about ten. It was drained off, and returned to the top can. The result was nearly the same, except that the syrup was a little thicker. Well, thought I, the trouble lies in the cheese-cloth. The sugar was taken out, and over this were put three thicknesses of new flannel. Again the results were not much more satisfactory. Three thicknesses of heavy white felt were then substituted, and still the syrup was too thin. At last, in desperation I went down to Mr. Burt's, and asked him where my trouble was. He could not tell. He had used *old* flannel, and got good thick syrup. Well, I have not yet found the "nigger in the woodpile," unless there is something in the fact that old flannel, which has been used, is more fuzzy, and consequently more impervious to the rapid escape of the syrup. As a last resort, we cleaned out all the sugar, leaving nothing but the felt. Over this was deposited very evenly cotton batting, about an inch thick, and over all one thickness of muslin. We then poured in the sugar and water as before, and next morning I had the satisfaction of seeing good thick syrup—that which registered 45 on the hydrometer scale used by maple-syrup makers to determine when the syrup is thick enough; but after drawing off the first pailful or two the syrup became thinner; and, to cap it all, the thing wouldn't percolate at all. We finally removed the felt, spread over the bottom a thickness of muslin; over this an inch of cotton batting, and then covered it with another thickness of muslin. Results: This combination is working finely; and, although we haven't found the "nigger" in the flannel, we have something better.

I have gone into details to prevent others from making the same mistakes we did.

I may explain to our readers that a hydrometer is a delicate instrument of blown glass, with a graduated scale. It is a very convenient implement for showing the thickness of honey or syrup for feeding. Maple-syrup makers tell me that the scale that they use is 32. This makes about 11 lbs. to the gallon, or about the usual thickness of ordinary extracted honey. They can be had at almost any hardware store; or if you can not get them near home we can furnish them for 35 cts.; postage 3 cts.

Later.—Since writing the foregoing I have learned from Mrs. E. R. that new unwashed flannel will let water go though it like a sieve; but after it has been used a while the woof, or web, becomes more dense. I asked her *how* she knew. She hesitated a minute, and said that *new* baby-diapers, unwashed, are not very serviceable until they have been through the laundrying process a few times. Our readers will pardon this allusion, for nothing but false modesty would object to it. The illustration is a good one, and explains why I had trouble with *new* cotton flannel letting the syrup through too fast, and why B. Taylor and Mr. Burt, using *old* flannel and *old* bed-blankets, had entire success. The "nigger" is found at last.

ROLLED VS. GIVEN PRESSED FOUNDATION; FLAT-BOTTOM FOUNDATION; HEAVY CELL-WALLS AND FAT COMBS.

REFERENCE is made in Bicycle Notes, in another column, to the experiment of R. L. Taylor, as reported and illustrated by a half-tone engraving in the *Bee-keepers' Review* for September. We have been experimenting a little with different weights of foundation during the past summer, and perhaps I can throw a little light on some of the results. Well, these results show that the "fattest" combs, if I may use the expression, were built from Given foundation; that the next fattest were from wax sheets sheeted for roller mills, but actually embossed or worked in the Given press. The next in order seems to be the Hunt foundation made on a Root mill. The rest of the results I have been unable to compare, any more than to state that the VanDeusen shows the "leanest" combs, to carry out the analogy, of all the foundations used. Mr. Taylor, concluding, says, first, that the quality of the wax in its original characteristics, or in the method of its manipulation, cuts a considerable figure; and, secondly, that either the kind of machine used in making foundation greatly affects its value; or, thirdly, that heavy foundation has a decided advantage over light. Mr. Taylor's third and last supposition, I think, is nearer the truth than the second, as I shall presently try to show.

Now, the various foundations above mentioned vary quite a little in the number of feet per pound. The VanDeusen (and this gives the leanest combs) was a trifle the lightest, being 14.22 feet per lb. The Dadant stood 14.21 feet per lb.; the Root, 13.75; the Given, only 9.91; while the Given-Hunt—Hunt sheets worked on a Given press—was 9.37. Now, if you will look again over these figures you will see that the Given and Given-Hunt, both made on the Given press, were quite a little the heaviest foundation used; and it was these sheets that gave the fattest combs. The fatness of the comb in the case of the other makes of foundation, in like manner, seems to vary somewhat according to the weights; that is, the lighter the foundation the leaner the comb, and *vice versa*. The figures do not show this to be strictly so, but strongly enough to show which way the wind blows.

A few months ago reports were given showing that the Given foundation seemed to be more readily accepted by the bees—in fact, very largely substantiating the facts above given; but it should be understood that the Given foundation, made between two flat plates, was a heavier grade—not heavier foundation septa, or bases, but far heavier foundation walls. I did not realize there was so great a difference between the cell-walls of the Given-press foundation and that made on the rolls until a Given press was sent us for experimental purposes. In fact, the walls were so heavy that the foundation looked more like sheets of wax with small hexagonal holes dented in equally distant from each other. It then occurred to me for the first time that it was not so much the *method* of embossing the sheets as it was the kind of dies, or punches, used in making the *cell-walls*.

I took a sample of the Given press foundation to our Mr. Washburn, and asked him to make punches that would make roller foundation like the sample, or very near it. He did so, and the foundation in every respect *seemed* to be as soft as that made on the Given. A test in the hive also seemed to show that bees regarded it in like manner. Of course, the foundation with heavy side-walls, with the same bases, or septa, will be heavier; and, also, the wax in these walls, not having been subjected to the same pressure as the wax in thinner walls, will be softer; therefore it follows that it will be worked by the bees the quickest; and such combs, being started first, will maintain their advantage, and be fattest in the end.

But right here it seems to me we run against a stump—or, at least, I fear there is danger of it. Will not those combs built from the heavy foundation, or, rather, that having heavy side-walls, show very objectionable "fishbone"? The VanDeusen foundation, which seems to have the poorest showing in the hive, may, when actually in the mouth of the consumer, have the best showing. The VanDeusens have advertised, as a special feature of their wax, that it had no "fishbone." How far this is true, I do not know from experience; but I do do know that there is no perceptible fishbone in the very light grades of foundation used by the Dadants, Hunt, and ourselves. If manufacturers should agree uniformly to make their surplus foundation with heavier walls—that which has given, according to the experiments of Mr. Taylor, fatter combs—consumers would object to it as not being like the honey of their fathers, and in time they would refuse to buy it, on the false assumption that it was manufactured, and therefore not real honey. As foundation-makers, we prefer to make our thin surplus just as it has been made.

In conclusion, let me say that I do not question the correctness of Mr. Taylor's experiments in the least. I accept them as actual facts, for I saw the combs myself while at his place this summer.

DEATH OF CHESHIRE.

JUST as we go to press we are pained to learn, through the *British Bee Journal*, of the death of Frank R. Cheshire, one of the most brilliant bee-keepers that England, or, indeed, the world, has ever produced. His work, "Bees and Bee-keeping," in two volumes, will stand as a monument to his memory long after his death. Probably there has never been any thing printed in the English language, in the way of scientific bee-literature at least, that is the equal of them. The evidence of painstaking research and careful study on the part of the author shines forth on every page. The presswork and the beautiful engravings, many of them from hand-drawings by Mr. Cheshire, and hence their correctness, are works of art. Friend C. was severe in some of his criticisms—perhaps unjustly so in a few instances; but, taking his works as a whole, bee-keepers for years to come will hold his name in grateful remembrance for throwing new light upon many subjects upon which there had been gross ignorance or misconception. It seems that he "died on the 16th of September, while undergoing an operation for a painful internal malady from which he had suffered for some time." We all unite most heartily with the *British Bee Journal* in "tendering to his widow and family our warmest sympathy in their bereavement." We may be able to give a further biographical sketch, accompanied by a portrait, later on.

CONVENTION NOTICES.

The County Bee Association will meet at the Tarbel House, Montrose, Pa., Oct. 25, at 10 A.M., for the election of officers, and any other business that may come before the meeting. All interested are invited. H. M. SEELEY, Sec., Harford, Pa.

The Illinois State Bee-keepers' Association will hold its regular annual meeting at the Statehouse, Springfield, Nov. 13 and 14, 1894. This change in the time has been made in order to secure reduced railroad rates of 1⅓ fare for the round trip. The National and State Granges both meet at the same time and place, and arrangements are made for the same person to sign all the certificates, which must be asked for when the ticket is purchased. Hotel rates will also be secured.
JAS. A. STONE, Sec., Bradfordton, Ill.

ON THE WHEEL—CONTINUED FROM LAST ISSUE.

When near Lima I saw some pumping-wells very close to the graveled road, and I stopped to investigate a little. As I started to go near the tanks, where the well was being pumped, I saw a man at a distance walking toward me. Thinking that, perhaps, they did not like to have visitors around unattended, I turned my wheel and ran down to meet him. He said they were quite willing to receive visitors, and show them around; but he felt a little anxious about having strangers go around alone. Only a week before, while standing on the top of a tank watching the oil and gas as they came together out of the pipe, a visitor, before he knew it, took a match out of his pocket, and proceeded to scratch it to light his cigar. Both the smell and peculiar vapor indicated that gas was all around them, and a terrible explosion would have ensued. What does ail people to make them so stupid? No wonder that men who have this kind of property in charge get short and crusty. After a very pleasant visit, just as I was going I learned there was a bee-keeper in the neighboring town of Cridersville who would give almost any thing to see A. I. Root. I had passed the town, however, and it was considerably off the road, so I decided I could not go back. When I came near to the city of Lima I was almost speechless with astonishment and wonder at the vast iron tanks scattered thickly for miles in every direction. Why, it seemed to me as if all the world could not use so much oil. Around each tank was an embankment of earth to hold the oil in case the tank should burst. I finally became so curious that I asked a workman, who was doing something to one of the tanks close to the road, if he had time to answer a few Yankee questions. He replied, "No, sir; I have not a minute to spare."

"But you can surely tell me about how much each of these large tanks holds."

"I do not know how much they hold."

"Well, excuse me, my good friend, in asking one more question, and then I will go away. What caused this terrible wreck and blackened remains just across the way?"

"Two of the tanks got afire."

Now, I wanted awfully to ask what set them afire, but I thought I would let him see I was true to my promise, even if I was a Yankee. As I wheeled along I said to myself, "Well, I will just go and hunt up a bee-keeper somewhere in this city; and if he will not tell me all I want to know, it will be funny indeed."

I wheeled into the suburbs of the town, and found a man beside the street, talking to one in a buggy. I turned up, sprang off my wheel, and commenced:

"Gentlemen, can either of you tell me where I can find a man who keeps bees or produces honey, anywhere in this neighborhood?"

The man in the buggy looked a little curious as he replied:

"Well, stranger, I think you have hit me exactly."

"And what is your name?" said I.

"G. A. Matteson, of Cridersville, O."

Then it was my turn to smile, and I said, "I am A. I. Root, of Medina."

You should have seen him start at the name.

"Well, I declare! is it possible, Mr. Root, that you have actually come on your wheel so near my own home? I do not know how many times I have longed to see you and have a visit."

Friend Matteson not only answered all my questions about the tanks and wells, but he took his horse and buggy, and carried me over to a well that was just being drilled. The tanks that were burned up had been struck by lightning a few weeks before. The great light given by this huge bonfire was visible after dark for 100 miles in every direction. In order to save the valuable material composing the tank they fired cannon-balls through its iron sides down near the bottom, and let the oil burn up inside of the dam that I have mentioned before. You see, these dams are absolutely essential in order to prevent the fire from running from one tank to the next; and the tanks are placed just far enough apart so that one can burn up without endangering its neighbor. Each tank holds about 35,000 barrels, and there are probably 500 or more of these huge reservoirs in the vicinity of Lima. They are the property of the Standard Oil Co.

As it was coming on night, I inquired my way to Bluffton, the nearest station on one of the railroads passing through Medina. Friend Matteson called to somebody he knew, to direct me where to take the right road out of the city. This individual happened to be one of the kind who can not tell any thing without getting in a good many hard words. A bystander presumed to dispute his ability to direct, and then the strong adjectives just boiled out from his mouth. I told him, as pleasantly as I could, that I would rather get lost than to hear so much bad talk. It wound him up suddenly, and I feared I had offended him. The rest began laughing at his discomfiture, and he was silent for a moment. I felt anxious, for I feared he might turn on them and swear worse; but to my surprise he spoke something like this:

"Look here, boys, the road is a crooked one; and a stranger, especially so near night, when he is in a hurry, might find difficulty in getting on the right track. I am going along with him to show him the way."

You see, he was a wheelman as well as myself. We chatted pleasantly on the way, and there was no more rude talk, I assure you. Then the words of the chorus of that beautiful hymn burst forth in my mind once more:

Oh glorious victory, that overcomes the world!

Pretty soon I was riding again after dark, in a strange country. Worse still, the recent rains had made quite a few bad mud-holes and muddy places. I found my little bell of much service, especially when I came up behind vehicles and passed them. It is only of late that I have used a bell; but I think I shall never want to ride much again without one. I never use it to ask folks to get out of my way, or in a way that they might think it was my intention; but when going up behind a team, a light touch of the bell admonishes the driver to gather up his lines and hold his horses from shying, as they might do if a wheelman should pass at any tolerable speed.

Between seven and eight o'clock I found a little town where my conductor told me I had better stop over night. The bell was ringing at the little church, and I soon found myself among a lot of Sunday-school children. They had met to practice for a coming entertainment. At the hotel where I stopped I was greatly pleased to hear the landlord ask a blessing before the morning meal. As there were quite a number of children in the family, they had their own breakfast in an apartment separate from the dining-room for the guests; but I could hear the words of the father, even through the closed door; and it rejoiced my heart to know that there are at least a few hotel-keepers who hold fast to the good old custom of acknowledging the great God above.

before the whole family, when commencing the duties of the day.

At Bluffton I had a most excellent visit with our friend Frank Eaton, known to many of the readers of GLEANINGS. He has a store in the town, where he sells and repairs wheels; so we had many things in common to talk over while we visited one of the oil-wells in the vicinity, where they have recently commenced pumping. Right in the town I noticed a well where many people were coming continually for a drink of water. Friend Eaton told me that it was an artesian well, drilled at considerable expense by a brother of his who is a Prohibitionist. The water has a slightly sulphurous taste, and reminded me of the beautiful fountain near the reservoir, and of the water at Green Springs. The people find it very wholesome, and agreeable to the taste, and it is largely and continually patronized. Now, friends, we have here a kind of temperance sentiment that bears practical fruit. It will always be a pleasure for me to clasp hands with any man or woman, no matter what creed or profession, so long as that belief runs into such practical work as furnishing convenient drinking-places for thirsty people.

Before I close I wish to say that the day I rode from Covington to Beaver Dam, a distance of 70 miles, the longest ride I ever made in one day, was one of the happiest days of my life. I really do not remember a day in my boyhood so brimful of enjoyment and thanksgiving to God as this one day; and it came about—at least a good deal—in starting out right. Had I not attended that prayer-meeting in Covington the evening before, I should not have felt so full of thanksgiving and praise—so full of "peace on earth, good will to men." By the way, this thought brings to mind one of the little cards that we have been furnishing free of charge for many years past, and expect to for years to come. Now, this little card would be especially appropriate to the wheel-riders of the present day—that is, if none of them will take offense if I should hand it to them. It reads:

A Sabbath well spent brings a week of content,
And strength for the work of to-morrow;
But a Sabbath profaned, what'er may be gained,
Is a certain forerunner of sorrow.

THE WONDERFUL SPRINGS OF CASTALIA, ERIE CO., OHIO.

On the 26th of September the boys kindly granted your humble servant another leave of absence, and I was soon flying westward. As H. R. Boardman's lay right on my route I made first for his place, making 37 miles in three hours and a half. Finding he was in attendance at the Norwalk street-fair I followed on. I wish, however, to mention one little circumstance that happened on the trip. I overtook a man driving a pretty fast horse; but as the speed that I was making was a little more than his own, and it was a little dusty, I passed him. He seemed displeased at this, and made frantic efforts to overtake me. As usual, however, he soon decided that he would have to give it up. About this time a man with a sulky overtook him. The latter horse was probably a trotter. The two talked together a little, and then the trotter came up behind me at a pretty good speed. When I heard a horse's hoofs behind me I increased my speed a little more, for there was no good reason why I should follow behind him in the dust. He seemed determined, however, to get ahead, and pretty soon his horse was in a gallop, and puffing and foaming. I just began to decide, that, as a member of the Humane Society, I had no right to be cruel to the poor horse, and was going to let him pass; but then I discovered I was only half a mile from friend Boardman's, and I thought his horse would stand it for half a mile, any way; so we came into the little town of East Townsend a flying. When I swung up among the bee-hives he seemed a little astonished. May be he thought I was crowded so hard I took refuge by making believe I wanted to stop there. As nearly as I can gather, horsemen are feeling a little jealous of the wheels; and perhaps farmers who raise blooded stock, as a natural consequence look upon wheels with disfavor. Liverymen may feel, in the same way, that it is cutting off their gains. I am sorry for this, and I think we wheelmen should do all in our power to discourage it. May be it is a Christian duty to ride in the dust sometimes; but it seems a little hard when the wheel itself ordinarily makes no dust, or next to none, and no horse and buggy is ever hindered in speed because of a wheel just ahead of them. I am sorry for this unpleasant feeling, and I think we should do all in our power to avoid it. Frank H. Eaton mentioned the matter, and he said he had known farmers who seemed so bitter against wheels that they would crowd them out of the road whenever a chance offered. Later on, however, when this same farmer's *boy* got a wheel of his own, it made a wonderful difference in things.

This street-fair that I mentioned seems to be something new. The principal streets of the town are, for the time being, vacated—swept up beautifully clean, and fenced off—that is, so far as vehicles are concerned. Then the business men of the town erect booths, and make a display of their goods, right out in the middle of the street. Of course, such fairs are held only in towns having paved streets. As there is no admission fee, a very large crowd gathers. There is no horse-racing whatever; and this fact, together with no admittance fee, is strongly urged as a reason why people should attend. In the afternoon, and perhaps evening also, a procession passes through the street—the barricade being for the time removed. The procession in Norwalk was about half a mile long. It was something after the fashion of the *Mardi Gras* in New Orleans. Every trade, industry, and manufacture in the town is mounted on wheels. A hardware man made a very pretty display with chain pumps, the galvanized iron chain furnishing the trimmings. A drygoods man exhibited a little schooner drawn by horses. The sails of the schooner were made of table-spreads, bed-spreads, etc. The whole thing was beautifully decorated with napkins daintily pinned on. It looked like a great white bird with wings spread. A printing-office, with compositors at work, and pressmen printing circulars, which were scattered in the crowd, was another feature. A baker with all his help made bread and cakes as his establishment passed along through the streets, and so on with all the other industries. So far the whole thing seemed to be a pleasant social and educational arrangement. Please pardon me, however, if I mention some things that it seemed to me were not educational in the right direction. A cigar-maker also exhibited *his* industry, and cigars were twisted up and tossed out to boys or men, or whoever might chance to get them first, and the work was done by women at that! A tobacco-dealer, in like manner, tossed out small samples of tobacco. Friend Boardman asked the question whether, if these schoolboys who ran for the samples of tobacco and cigars thereby learned to use the weed, there would not be here a flagrant transgression of the laws of the State of Ohio, and that right out in open day, at a public gathering. Let me digress a minute. Friend Boardman once used tobacco

himself. Yes, he was such a slave to it that his hands trembled so it was difficult for him to even write his own name without having the jagged lines exhibit the terrible raid the poison was making on his system. That was 25 years ago, however. Friend B. debated the matter alone. As the tempter drew the chains stronger and tighter, he questioned: "Is it *I* who decide these matters, or is it an artificial appetite that has enslaved me for the rest of my life?" He marched to the door and gave his tobacco a fierce fling, and declared he would be free. He fought the good fight, and came out victorious; and as he told the story he held out his hand to show me that his nerves were as firm and steady as cast iron, and yet he is now a little past 60 years of age.

As the sun began to decline I told the friends I would have to hurry on, as I wished to reach Castalia before night. With the aid of beautiful fine graveled roads, I reached the place between four and five. All the way, you may be sure, I was studying the lay of the land, etc. For miles around Castalia the ground is thickly strewn with thin flat stones. In fact, these were picked up and piled up so as to make a smooth solid wall; and these walls, in many places, take the place of fences. Before the ground can be worked, these flat stones must be picked out and carried out of the way; and this material when pounded up makes the most beautiful roads, providing the last finish on top is made of fine gravel, which is to be found occasionally.

Right around the Castalia springs, in addition to these flat stones, we have a queer formation that looks a good deal like a sponge. It is limestone, and it is supposed that these strange springs have something to do with it. The spongy limestone is gathered up and shipped off on the cars. There is also quite an industry in digging out marl for the manufacture of cement. This marl is found perhaps two or three feet below the surface. The spongy limestone is used by blast-furnaces in refining iron, and it is also used in paper-mills in some way in the manufacture of paper. You may remember I passed through the town once before. I crossed what I called a little mill-pond, covered over with thick green scum. Had I looked at the water right over the side of the bridge, I should never have passed through Castalia as I did. Between the fragments of this green scum or moss is the purest and most beautiful spring water to be found on the face of the earth. Every pebble can be seen clear to the bottom, even if that bottom be thirty or forty feet deep. There is no discoloration of the water anywhere. The stones and pebbles that line the side of the pond never look muddy and chalky from sediment left by evaporation. Every thing is changed here at Castalia. It makes one think of that first verse in the last chapter of the Bible:

> And he showed me a pure river of water of life, clear as crystal, proceeding out of the throne of God and of the Lamb.

What at first seems to be a green scum on this little pond or lake that reaches clear through the town of Castalia, is, on close inspection, found to be a queer sort of vegetation, or broken fragments of a kind of seaweed. The crystal waters of this pond emanate from four immense springs. These springs unitedly form what might be called a rapidly moving millrace; and, in fact, mills have, in former times, been carried by just the water from these springs. Right on the edge of this crystal pond is the home of Mr. Robert Barrell, and toward a hundred hives stand almost on the water's edge. I shall always be greatly indebted to Mr. B. and his family for the courtesies extended to me. We took a boat and pushed right through the moss, over the waters of the pond. If you look straight down over the side of the boat there seems to be quite a depth of water; but as you look off obliquely, the refraction makes it seem as if the boat stood over a deep pit, the bottom rising up all around you; but this bottom is almost everywhere pretty well covered with this strange seaweed, or moss. As these great springs keep a temperature at almost the same point, winter and summer, the vegetation seems to go on uninterruptedly. Near the springs, however, the plants seem to change some—probably owing to the great coolness of the water. Each spring is a deep pit with steep sloping sides. During the lapse of ages, different things have been thrown into these springs; but in each one of them one can see away down in the depths the mouth, or "crater," I should call it, from which the water issues. Soundings have been taken by letting down weights attached to a line, as deep as 70 feet, and some say much deeper, without striking any bottom. It seems strange that the water-passage should be straight down in the earth to such an extent that a line can be dropped this distance. The bottom is much like that in Green Springs. The mosses, and perhaps the influences of chemicals, have decorated the rocks and soil with bright many-hued colors; and right around the springs the moss in some places looks like beautiful silky auburn hair. The scum on the top of the pond is probably caused by bits of moss breaking off and floating to the surface. Friend Barrell says that, in the spring, before natural pollen, the bees pack large quantities of this substance on their legs, like pollen, and carry it to their hives for brood-rearing. Below the pond the water is conducted in a swift-moving stream close to the main street or corners of the town. Here it flows over a pebbly bed made mostly of broken limestone. If you have any fondness for babbling brooks of crystal purity it will pay you to go a hundred miles to visit Castalia. The sight of that stream of water, right in the heart of the town, rippling over its gravelly bed, seems like enchantment. One stops to wonder how it can be possible that this water can be so clear and pure and clean, with dusty streets so near by. In fact, it has a look as if there were something supernatural about it.

Perhaps I should explain here, that a company of anglers have formed a club, and purchased not only the springs, but the land adjoining the stream for several miles—in fact, from Castalia clear to where the waters enter Lake Erie. The whole stream has been beautified and fitted up with green banks, beautiful lawns, shading-places, or bridges, for the fish to dart under; and last, but not least, the waters have been stocked with speckled trout from away down east. The spring water suits them to a T. One can see them by the hundreds, darting about almost with the swiftness of light, moving under these shades, or bridges, as spectators come near. Of course, this rich company monopolizes the fishing. Not a schoolboy in the town of Castalia dares throw a "pin hook" into the stream or into the pond. Mr. Barrell says that, if he should stand in his own dooryard, and toss a line out into the water, he would suffer fine and perhaps imprisonment, so strictly are the laws enforced by this club. One is inclined to remonstrate at this state of affairs; but this company of fishers paid the price of the land, and it is all their property, even the pond right in the middle of the town, as much as your farm or dooryard is your own property. There are a dozen or more springs in and around Castalia; and some of them are fitted up in most beautiful shape by the angling com-

pany. The fine grounds are plainly visible to travelers in passing through Castalia on either of their two railroads—Cleveland, Cincinnati, Chicago & St. Louis, or the Lake Erie & Western. The water is deliciously cool, and one would almost call it pure soft water, judging by the taste. I am told, however, that it contains some chemicals that prevent it from making suds with soap; but it seems as if one could scarcely ask for finer or colder drinking-water. As this location is considerably above the waters of Lake Erie, it has always been a mystery as to where the water starts. A traveling man told me, however, that on some very high ground near Bellevue, O., there was a place where a considerable stream of water ran into a hole in the ground and disappeared. This, of course, is many miles away from Castalia. If this is the same water, nature has managed to filter and purify it, and cool it, in a way that man might be glad to imitate if money could be made to do it.

The Castalian springs were pretty well looked over before dark, on the day I left home. Next day friend Barrell kindly took me with his buggy to the borders of Lake Erie, about four miles from Castalia, on to a piece of rising ground which has been called, for many years, Mustcash. A grape-grower by the name of C. Q. Martin has established a beautiful peach-orchard and vineyard on this hill. An opening near where his home stands enabled him to discover crevices in the rocks, whereby he could go down about thirty or forty feet. At this depth he discovered water having the same crystalline transparency as the Castalian waters, and, besides that, being almost perfectly pure. This water will form a suds, and wash beautifully. The temperature is 44 degrees—about 6 degrees lower than the water of any wells or springs to be found elsewhere in the United States. The water stands at a uniform depth all through the hill. If it could be pumped out, there would probably be more caverns to explore. The waters have obtained such a reputation, that, two or three years ago, a company was formed, and a large shaft was sunk from the top of the hill clear down to the water. A beautiful engine, 40 H. P., is placed at the bottom of this shaft; and the steam-pump sends a constant stream of water through a six-inch pipe to the city of Sandusky, about seven miles away. The water is then carried about the streets of Sandusky daily, and sold for drinking-purposes, at two cents a gallon. Oh that we could have such water as this in every home in our land! I honestly believe it would do more to save doctors' bills than almost any other one thing in the world.

I had a great curiosity to explore these caverns, and to figure out, at least to my own satisfaction, what caused them. I do not know what scientific men have done in this direction; but my conviction is, that earthquake or volcanic action has at some time in the past made an upheaval, forming the rocky hills along the shores of Lake Erie. This upheaval in this locality probably dropped back a little; but in dropping back, the stones and rocks that were rent did not exactly come back in place, leaving these broken openings. The caverns are entirely different from those of the Mammoth Cave, for the latter were cut out by water; but the water seems to have little or no effect on the rocks in these caverns; in fact, the stones above the water-line are so dry that I squeezed through openings upon my hands and knees, all about among them, and scarcely soiled my clothing. In fact, this wonderful spring seems to be entirely sheltered, even from the rain water. As everybody goes in and out as they choose, all of the best specimens of rock crystal have been chipped out with hammer and chisel. Almost every one suggests that the waters come from Lake Erie. But, hold on, friend. They are up perhaps twenty or thirty feet *higher* than Lake Erie. At one place at the side of the hill there is a running spring; and friend Martin tells me that one day he was greatly astonished to find the water in a shallow well had suddenly risen two or three feet. Investigation showed that the waters in the cavern had risen correspondingly. After he had wondered what convulsion of nature had suddenly changed the dead level that had been so constant for so many years, he found that his neighbor, who owned the spring, had made a dam at the outlet, so as to make the water deep enough to wash his sheep. This caused a sudden rise all over the locality. Well, now, one would think that this six-inch pipe, operated by a powerful engine, with its constant pull, would lower the water in the caverns; but so far it has not done so, even to the extent of the fraction of an inch. Its depth is said to be unknown, "as soundings to 200 and 300 feet have in some places failed to reveal it." When you go to Sandusky, be sure you get a taste of the famous Crystal Rock spring water—that is, if you never tasted it.

In closing, permit me to say a word about grape-growing along the lakes. Friend Martin tells me that his finest grapes grow on his poorest soil, without the application of a particle of manure. In fact, the most beautiful crop of grapes I ever saw in my life—grapes of all varieties—are on just such soil. All he is doing or all he has done for years past is to kill the weeds, trim the vines, and gather the grapes. He says they are very much more free from disease, and the quality is much finer, where there is no sort of fertilizing done. Friend Boardman told me that it was exactly his experience, and he is somewhat of a grape-grower.

IRRIGATION FOR PEACH-TREES.

While at the Castalia caverns, I noticed such beautiful peaches on the grounds of friend Martin that I purchased a dozen baskets, and had them sent home. Afterward, however, I found some much finer near the shaft that goes down into the caverns. Friend Martin told me, however, that these were not yet ripe. He said they were irrigated with the spring water; and it not only had the effect of making them much larger, but of making them later. The trees were a wonderful sight in the way of luxuriance, and the peaches the largest and finest I ever saw anywhere. The difference in size between them and those I had already purchased was doubtless owing entirely to irrigation, as they were of the same variety. And here is one straight piece of evidence that it will pay to irrigate peaches during a dry season where water is handy. I engaged a dozen baskets of these at 50 cts. per peck basket. They are the largest and finest peaches I ever saw this side of California.

HOW BASKETS, ETC., ARE MADE.

When I called at friend Boardman's on my return home he was just ready to "go fishing," and urged me to go along; and when he declared he would go out on Lake Erie, and fish for rock bass all by himself, if nobody would go with him, it was more than I could stand. I can not stop to tell you of the pleasant time we had, but will mention that, on our way home, we visited the Berlin Heights fruit box manufactory. They are well known to many of our readers as manufacturers of bee-supplies also. Just at the time of my call, however, all hands were busy at work on baskets for peaches and grapes. Did you ever wonder how it is possible to make a nice, neat, light, handy half-bushel basket so it could be sold for a nickel,

or a little less than four cents by the quantity? Well, this is the way they do it: They take green logs, about four feet long. These are put into a big turning-lathe, with the requisite machinery, to pare off a thin veneer of wood, much in the way your mother pares a long potato. The log keeps rolling in the lathe, while the sharp keen blade works closer and closer toward the center. The shaving that comes off is about like a roll of wall-paper. In fact, the whole operation is like pulling off the end of a strip of wall-paper so as to unroll a big roll. Then these big sheets of wood, like unto paper or thin pasteboard, are cut into strips or basket splints by machinery. Expert women weave these splints together so as to make the bottom of the basket. Then a boy takes this bottom, with the splints sticking straight out all around, and pushes it into a form so that the splints stand straight up — or, rather, straight up off on a diagonal. Then he winds a piece of heavier stuff around the basket, so as make the hoop that goes around the edge. This is all done with such lightning-like rapidity that you can hardly see the motions of his hands. Before commencing he fills his mouth with tacks. It made me think of the boy I have read of, who, while fishing, carried the bait in his mouth, so as to have it handy and in good condition. I wondered if the sharp tacks did not prick his tongue. He looked very pleasant and good-natured about it, if it did. But the most wonderful part of it all was to see those tacks get out of his mouth and into the rim of the basket, just in time to catch the quick strokes of the light hammer he held in his hand. Why, before you could say "Jack Robinson" every nail was in its place, and clinched down at that. Then he tossed the basket over to a man with a great big sharp buzz-saw. The basket was crowded into a square box, and pushed against the saw until all the splints sticking out, and a little of the rim, were nicely trimmed. Then the buzz-saw man tossed the basket over his head, and it disappeared somewhere in the upper air. Afterward we found a person in the loft above who caught the basket as it came up through the hole in the floor, and handed it to some women who nailed on the handle. There is your basket—labor, tacks, and timber, thrown in, all for less than four cents. As these baskets are very bulky and unwieldy to ship, at the same time being of very small value for the space they occupy, it seems almost necessary that they be made right in the fruit-regions, so the fruit-grower can back his wagon up at the door and take his baskets straight to the peach-orchards to be filled.

The fishing and the baskets made me so late that I decided to take a ride home after night. Just as I had begun to feel the exhilaration of drawing in great breaths of fog-laden air as I passed through the low lands (you know I have mentioned this to you before), I came up out of the valley and saw a farmer and his wife going somewhere by the light of a lantern. It made me think of my father and mother, away back on the old farm. I decided that they must be going to meeting. Pretty soon a little church with a lighted lantern in front proved my surmises to be correct. Quite an audience had gathered, and they were singing one of my favorite hymns. Although I did not know the name of the town, nor what denomination these people belonged to, it was a real pleasure to join with them in worship. I had been away from home three days in the middle of the week, and found a prayer-meeting or preaching each evening. The good pastor noticed a stranger among his people, and it was my privilege to give my testimony with the rest. Now, dear friends, so long as it is true that Christian people are gathering together all over our land, in every little town, and on almost every day of the week, to worship God and to ask his guidance, our country is not so very far gone in wickedness and iniquity. "Ye are the salt of the earth." "Ye are the light of the world."

And be ye kind one to another, forgiving each other, even as God also in Christ forgave you.—EPH. 4:32.

I have many times felt sad to think that it is not possible for me to look over all of our correspondence and business deal, and give directions for its management, as I used to in years gone by. We have plenty of willing helpers, providing they knew just exactly what I wanted done, or what I would have done under special or peculiar circumstances. A little transaction that came up a few days ago has induced me to take up the subject which our beautiful little text above covers somewhat. Perhaps I may remark that a certain class of letters, especially if complaining letters, usually come directly to me. The one below is of that class. We give only the initials instead of the full name, because we would not willingly hurt any brother's feelings, or give him pain:

Mr. Root:—Yours of the 10th inst. is received. As I stated before, I will send the three dollars just as soon as I can, which will be after I gather my crop—not because it is justly due you, but because class laws will give you the privilege of collecting it.

U. H. W.

P. S.—Read the fifth chapter of James.

In the first place we try to have it distinctly understood that our establishment never wants a copper from anybody unless it is justly due; and, as a rule, we would not want any thing unless the debtor *also* agreed that it was justly our due. I do not know just exactly what friend W. means by "class law;" but his postscript, where he directs me to the fifth chapter of James, would indicate that he stands with quite a large class of people who have recently got into a way of laying all the troubles that beset our nation at the present time to the fact—or at least they call it a fact—that the rich, or the men of capital, if you choose, monopolize not only the property, but make our laws. I have not time nor space here to enter into a discussion of this matter. If friend W. would pay me a visit I think he would be satisfied that my dress, appearance, and habits do not indicate that I belong to the class alluded to in the first verse of the fifth chapter of James. My clothing is never expensive, and very often it is so untidy-looking that business men would look all over our establishment before they would think of calling *me* A. I. Root. I do not know that my course is just right in this; but while I am around home I am so often called upon to go down into the basements to look after the sanitary drainage, water-pipes, or machinery, that it seems almost folly for me to put on expensive or new clothing for my daily work. I have never had a gold watch nor a gold chain in my life, but constantly use a Waterbury for a timepiece; neither do I ride in a fine carriage. I presume I may be excused from saying any thing further on this point. It is true, I do have the management of a considerable amount of capital; but this capital is all used in giving work to or otherwise benefiting

my fellow-man—not that I may put on fine style, or that any of the members of my family may do so. We are all humble, moderate, hard-working people. My good wife does her own housework, and has done so for years.

Just a word or two more in this line, and then I am done with this part of my subject. There are in our neighborhood certain people who say that farming does not pay: and of late they are getting into a way of insisting that nothing pays unless a man is rich; and if they do not say it right out, they seem to imply that no man gets rich except by fraud and sharp dealing. The Bible tells us, "By their fruits ye shall know them." And along this line let us inquire what is the result on the man, his farming, or his business, when he falls into line with this sort of people. I need not answer that question. You see it in your own neighborhood. Some two or three years ago one of these men told me that it was only a question of time—we were all going into bankruptcy sooner or later, and that my turn would come with all the rest—perhaps a little later. This is an extreme case, I know. The man who said it I regard as a very good man; and I rather think he takes a more hopeful view of things *now* than he did then—at least, he has, so far as I know, abandoned that line of politics, and is now hard at work. Now, friends, do not feel hurt, any of you, on account of what I have said. I profess to be a Christian, and as such I have a *right* to be hopeful; and if I did not have faith in God and humanity I should not be a very good follower of Christ Jesus. I know there are wrongs and injustice; I know that men of capital are often overbearing and selfish; but I think I know *also* that there is a good prospect ahead for honest and hard-working men.

After I had looked at the letter a little I said to the clerk, "Hasn't this man been embittered toward us by some business transaction?" The book-keeper replied that he had not, so far as he knew. Finally I said, "Please bring me all the correspondence from him you can find." Pretty soon my heart was rejoiced to find the following old letter:

Mr. Root, dear Brother in Christ:—Inclosed please find a postal note for $2.48, for which please send me First Steps for Little Feet, three copies, $1.10; Christian's Secret of a Happy Life, one, 25 cts.; back dues on GLEANINGS, $1.00. Total, $2.48.

Dec., 1890. U. H. W.

The part that made me feel happy was the opening sentence. The letter, you see, dates away back to 1890; and the books that he orders are none but those that a Christian man would be likely to buy. After a little careful examination I decided I had found at least one clew to this great change in his attitude toward our establishment, and it pained me to the heart when I saw it. The retail price of the little book, First Steps, is 50 cts. Our good brother wanted *three* of these books, and he carried out the price at $1.10. I remember that, when we got these books of Charles Foster, he objected to letting us sell them at the very close margins we ordinarily sell our goods. He said the established price was 50 cts., and that we must not sell a *single* book at a less figure. He consented, however, to letting us make two or more books at such a price as we thought fit; so we advertised one book at 50 cts., or two at 75 cts. Now, friend W. reasoned that, if we sold two books at 75 cts., we might do still better, or at least a *little* better, on three. Three at 37½ cts. would be $1.12½. He took the liberty of putting it $1.10. There is nothing in our price list to indicate to the clerk or customer how low we could sell three books. I have, however, again and again assured the clerks in our establishment, and often with much emphasis, that, where a man has secured a low rate on any article by buying in ten or dozen lots, all additions to such an order, making the quantity purchased still larger, should certainly be at the same rate—not any higher, surely, but, if any thing, a little lower. In order to know how much lower, they usually consult our business manager, Mr. Calvert, who makes all our purchases. Now going back to the letter: The clerk who filled the order drew his pen across the $1.10, and wrote above it, in ink of a different color, $1.25. He reasoned thus: Two books at the advertised price, 75 cts., and one book at the advertised price, 50 cts., makes $1.25. I can not discover, however, that any explanation was ever made. In any such matter, any one feels a great deal better about it to have the whole thing explained. I know I should. Of course, friend W. was asked for the difference. He, however, takes it in very good grace, as would seem from the letter below:

Mr. Root:—Inclosed please find postal note for balance due on books; yet I can't see why you charge $1.25 for three First Steps for Little Feet, when you advertise two for 75 cts. Please accept thanks for sending the books without the full amount. U. H. W.

It may have been a rather hard matter for him to reconcile such a transaction from his valued and trusted friend A. I. Root; but he concludes, perhaps, that it is a small matter, and he will let it go. If I am correct, however, the matter is not easily dropped. Afterward, in reading the Home Papers, the whole effect would be spoiled because he had lost confidence in the man whom he had formerly looked up to as teacher. Surely it would seem that some explanation should have been given on receipt of the above; but all I can find is written on the letter below—"I think that is correct," with the signature of the clerk who attended to that department.

As I am supposed to be the offender in this case, I think I may be excused if I speak pretty severely in regard to such matters. There are a good many business places where you can get low figures providing you make a bargain first as to what the price will be; but if you make your order *first*, without saying any thing about the price, there will be a vast *sight* of difference. They seem to put on all they think a customer will bear. It is true with some people when they get the money in their hands, they seem inclined to hold on to every copper they can. If they can not give a consistent reason for keeping all or pretty nearly all of it, they give some reason that is *not* consistent. I do not know of any thing else in this world that so vexes people—especially well-meaning, hard-working people. It makes them bitter toward the world, and bitter toward humanity. They lose faith in every thing; and they get so they imagine fraud and evil at every step. O dear friends, if I have any influence over you, please believe me when I tell you this thing is one of the grievous troubles with Christianity. A professing Christian sends out advertisements, and tries hard to get customers; but as soon as he gets a customer, and begins to get things into his own hands, he lets that leading sin of all sins, *selfishness*, creep into his heart, and vexes and angers both friend and foe by his littleness and stinginess and selfishness in deal. May God help us to think as much of our neighbor's pocketbook as we do of our own.

An incident of but a few minutes ago illustrates the point I wish to emphasize. A relative of mine has been here on a visit. She was just going home, and wanted to take a barrel of fruit. I asked the question at the office, where our book-keepers are at work, whether the bar-

rel of fruit could be checked as baggage. The answer came, that, if I put it into a box with handles, or made it look like a trunk, then it could be classed as baggage. Said I: "But, look here, good friends, it is *fruit*, and not baggage, we wish to send. If the fruit is to be covered up, and made to look like something else, so there will be even a little deception in the matter, I should much prefer to send it in the usual way, and pay the freight."

One of the girls in the office said that she had often sent fruit in that way; and Mr. Calvert suggested that it was not deception—it was simply fixing the fruit so it could be as easily handled as trunks and ordinary freight. Now, I have not yet found out who is right or wrong in the matter. The real point comes next. Just then I remembered something else that was on my mind, and I remarked: "Oh! say, John, those American Pearl onion-sets from Johnson & Stokes got here yesterday, and Mr. W. says the freight all the way from Philadelphia was only 35 cts. Isn't there some mistake about such a small price?" One of the girls here suggested, with a twinkle in her eye, that doubtless there was some "deception" about it; and one of the others said that, if the price was too low, why not keep quiet, and not say any thing. The clerks all knew my disposition in such matters, and they were rather running on me, and having a little fun at my expense. Now, then, nobody ever feels hard when the charges for carrying stuff are *surprisingly low*. Nobody ever suggests that the railroad company is guilty of *deception* when they make a mistake, and put the charge too low. But why not? If it were not for this sin of selfishness, we should be just as anxious to have the matter righted when the railroads have charged too *little*, as when they have charged too *much*. What an idea! charging the company with fraud because they brought your goods too cheap! May God help *me* to be just as anxious to have the mistakes corrected when it is too *little*, as when it is too much—even with a *railroad company*.

You will notice that the last letter is dated Jan., 1891. In Dec., 1893, comes the following:

Mr. Root:—Please stop my GLEANINGS, for I have not got a dollar to pay on what I owe you now, but will pay as soon as I can. U. H. W.

Perhaps friend W. has had reverses in bee culture, like the rest of us. May be he has lost his enthusiasm, and does not take very much care of his bees. But aside from that, there is no question that he has lost his faith in A. I. Root; and it may be, dear friends, that, in losing faith in me, he has lost faith in God. Such things do happen. I tell you, we who profess to be followers of Christ can not be too careful. Of course, the Christian should not be stumbled by what any *man* may do. He should look straight past humanity to Christ Jesus. But it takes a *veteran* to do this. You know how it is yourself. Once, under great provocation, I said, "If it really transpires that this man has been stealing money intrusted to his care, I am afraid I can never have faith again in humanity." A loss of faith in humanity comes pretty near a loss of faith in God; and we should look out, and be very careful how we even speak or think in this way. It turned out, however, that the man in question was strictly honest. He was unwise and very careless; but he was honest before God, and is honest and straight to-day. One who has just started out in the Christian life is more liable to be stumbled. He has not been through the battles, and seen God and righteousness triumph over evil. A new convert is especially likely to be discouraged, and turn back when he sees a man act hypocritically.

Several times the readers of GLEANINGS have made objection to such expressions as "Brother in Christ;" and I have sometimes felt as if they were unwise and dangerous. When somebody writes to me a letter, and tells me how my writings have helped him, and how he looks to me monthly for faith and strength to hold out in the Christian warfare, I often feel like writing back to him, "Dear brother, do not place too much faith and confidence in me. I am poor, weak, and sinful. If you really have faith in me—if you really have been helped by my writings, please save up a big lot of charity to tide you over when I shall do something that looks on the face of it selfish and grasping. Save up enough of this kind of charity to hold fast your faith in me until something transpires, or until you can write me for an explanation." It just now occurs to me that our good brother W. *did* write for an explanation. When he inclosed the balance on those three books, First Steps,* he said he could not see why we should charge him more just because he ordered three copies (¼ dozen) instead of two copies; and he honestly supposed that A. I. Root, his old and tried friend, answered coldly, "I think that is correct." Perhaps some of you may suggest that this clerk was not fit for the place. But I beg of you, dear friends, to remember that clerks are but human. Some of them do very queer things without thinking they have done any thing wrong. Right here permit me to say that our clerks, in such matters, are always loyal to the business. Somehow they will get it into their heads that, when there is a question, our establishment should have the *best* side of the bargain, or the best construction on any matter of prices where it is not clear. I do not want this. Our business was not built up in that way. Where there is a question as to what is right and wrong, I would always be courteous enough to a customer to give him the benefit of any question there might be in opinion—yes, even though we might lose some money by so doing. Make your advertisements so they do not promise very much, or make your prices so there is a respectable margin; then, instead of failing to live up to your agreements, try to do a little *better*, if any thing. Remember, it is not simply a matter of building up a reputation, but it is honoring Christ Jesus. It is glorifying the great God above, who created you in his own image. It is Satan who prompts us to be little and mean, and close and stingy. It is he who prompts us to cheat, and wiggle out of a selfish transaction, without owning it up and making reparation. I do hope that every clerk in my employ—and I wonder if they will be offended if I say every "brother and sister" in our employ—will read this Home Paper, and will comprehend that our business is not conducted to make money altogether. It is to honor Christ Jesus—to glorify God, and to bring out the better part in every human being. May the great Father above help us to make mankind *better* instead of *worse*. May he help us to make every transaction so fair and honest that we shall never be afraid of investigation; and may he help us to avoid all temptations in the way of being short or important or overbearing with our customers. In short, may he help us to be "kind to one another, tender-hearted, forgiving each other, even as God also in Christ forgave you."

---

*Cheating about any thing is bad business; but the idea of exhibiting a selfish and grasping spirit to a customer who ordered such a book as "First Steps," seems really awful in its inconsistency. I wrote to friend W. as soon as I discovered it, and made the bill an even dollar for the three.